

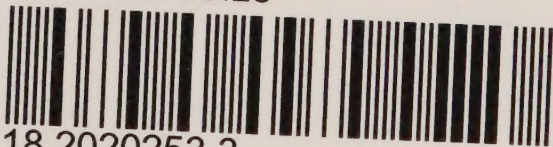


INSTITUTE OF ARCHAEOLOGY, FORMERLY ST. JOHN'S LODGE
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UNIVERSITY OF LONDON
INSTITUTE OF ARCHAEOLOGY

FIRST
ANNUAL REPORT
1937

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INTRODUCTORY NOTE

THE annual reports of the Institute of Archaeology are designed to contain a resumé of developments and work done during the preceding year, and to contain from time to time summaries of lectures of outstanding general interest. For the rest, research-work carried out through the Institute will be published, in so far as other suitable media are not available, in the form of special papers or monographs. Like the annual reports, the special papers (but not the monographs) will normally be issued freely to Members of the Institute, in accordance with the Membership scheme printed at the end of this report.

R. E. M. WHEELER
Hon. Director

January, 1938

The Opening of the Institute

THE Institute was formally opened on April 29th, 1937, by the Earl of Athlone, K.G., Chancellor of the University of London, in the presence of the Vice-Chancellor (H. Lightfoot Eason, Esq., C.B., C.M.G.), the Acting-Principal (S. J. Worsley, Esq., D.S.O., M.C.), the Right Hon. W. Ormsby Gore, M.P., and a representative assembly. Sir Charles Peers, C.B.E., Chairman of the Management Committee of the Institute, opened the proceedings with the following speech :—

CHANCELLOR,

On behalf of the Committee of Management of the Institute of Archaeology I desire to offer you a hearty welcome to this building, now being adapted to the study of archaeology, and shall ask you to set the seal of your approval on what has so far been done, by declaring it open.

The establishment of an Institute of Archaeology, in connexion with the University of London, has long been in the minds of many of us. It is now nearly nine years since the question was raised by the Board of Studies in Archaeology ; since then it has been on several occasions considered in detail by that Board. But in order to bring the scheme to public notice, it was thought advisable that a national Committee should be formed, and in 1932 it fell to my lot, as President of the Society of Antiquaries at the time, to take the first steps in that direction. A conference, to consider and develop the scheme, was summoned, and that it was fully representative will be made clear when I say that the British Museum, the British Academy, the British Schools in Athens, Jerusalem and Iraq, the Hellenic Society, the Society for the Promotion of Roman Studies, the Egypt and Palestine Exploration Societies, the Royal Archaeological Institute, the Royal Anthropological Institute, and the Institutes of Art and of Historical Research all took part in its deliberations. As a result a statement and appeal were drawn up and appeared in the Press, and a Committee was appointed to organize the appeal. For the past five years that Committee has carried on its labours, and, though progress has been slow, we are here to-day in evidence that progress has been made.

To the Appeal Committee has been added a Committee of Management, whose function it is to administer the Institute for the University, and it is as Chairman of that Committee that I am to give the briefest possible account of our doings to-day. If the essential character of this Institute may be expressed in a word, it is this, that it is a laboratory : a laboratory of archaeological science, wherein the archaeologist of the future may learn the essentials of his business. One of the newer sciences is this of ours ; not a few of us here to-day may have known and spoken with the men whom we regard as its founders, but it has the vigour of youth, and, though knowledge

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takes no account of frontiers, we may look with justifiable pride and confidence on what has been and is being done by British enterprise here at home and wherever in the world the records of past history offer themselves for investigation.

In this Institute then, it is necessary that the student shall find three things : namely, materials for study, instruction in the treatment of antiquities, and training in archaeological method, in research and in the recording of research. This is the irreducible minimum, and, while the principles of archaeological inquiry are sufficiently defined, there can by the nature of the case be no limit to the elaboration of its technique, and to the recognition of its relations with all phases of the story of nature and of man.

A start has been made : we have already the beginnings of a library : we have an ever increasing collection of British antiquities, and we have the large and important collection of Palestinian material brought together by Sir Flinders Petrie. We have also, for a period of years, this building in which to work and house our possessions. But we look forward to greater things, and particularly to finding our permanent quarters in the great new buildings of the University in Bloomsbury, side by side with the Institute of Historical Research and the Institute of Art. We have an admirable Secretary in Miss Kenyon and to our honorary Director, Dr. Wheeler, we owe more than we can say. To those liberal benefactors who have made it possible to do what has been done, we express our warmest thanks, and desire to draw your attention to their great services to our cause. One, the most generous of all, is no longer with us, but is to be named to us to-day, and to be commemorated by a memorial in our galleries. And there is one other, who gave ungrudgingly of her best and very literally spent herself in our cause, to whom our gratitude and our affection will ever be due. To her we are to ask you to unveil a tablet in this room, which will be a perpetual memorial of our debt.

There are other matters in our short history upon which I might touch, but it must suffice to say that as we have done what we could with the means at our disposal, so we must look forward to wider opportunities and greater resources in future, and on this note I must end, and invite you now to honour us by declaring this Institute open.

The Chancellor, after referring to the outstanding services of Sir Flinders Petrie to archaeology, and to the important gift of the Petrie Palestinian collection to the Institute, said :—

In accepting the invitation to open this, the newest addition to the institutions of our growing University, I am conscious of performing a task which has long been inevitable in the orderly development of our academic machinery. The foundation, now some sixteen years ago, of the Institute of Historical Research provided a focus within the University for the written *social and political* history of civilization. The more recent establishment of the Courtauld Institute of Art has organized and expanded the teaching of the *aesthetic* history of civilization. It was left for an Institute of Archaeology to co-ordinate and extend the study of *material* civilization, with a special regard for those periods and places where the written record is inadequate or altogether absent. The three Institutes clearly have much in common ; each is in some sense incomplete without the others. But each has its own special work to do, and, in view of the increasing range and technical achievement of modern archaeology, the task of the new Institute will be no less complex and arduous than that of its older brothers.

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The primary function of the Institute of Archaeology, as Sir Charles Peers has told us, is to provide a laboratory which shall fulfil in the study of civilization something of the function which the laboratory has long fulfilled in the study of chemical or physical science. The Institute is designed to provide properly classified collections of material, derived wherever possible from scientifically conducted excavations, for the use of the student and the research-worker under normal laboratory conditions. In this function, the Institute has the support of the established museums which by the nature of things can never, with the best will in the world, be expected to cater indefinitely for the individual student. The collections of the Institute are thus supplementary to, and in no way competitive with, public museum-collections of the traditional kind.

In addition to its function as a store-house of material, the new Institute is designed to comprise by degrees a home for teaching and research in those spreading provinces of archaeology for which no adequate provision exists at present in London or, in many cases, elsewhere. Since the days of the Renaissance, *classical* archaeology has formed, however vaguely, an integral part of a normal liberal education. Within the last century the study of the wonderful civilization of *Egypt* has received recognition in the syllabus of our University and of other universities. But more recently, other fields have been opened to archaeological investigation by changing political conditions or by a reorientation of interest. These new fields include Mesopotamia, Syria, Palestine, Cyprus, and several regions of what used to be described as 'darkest Africa'; nor may I omit to add to this list our own country where, during the last quarter of a century, the body of research has far outstripped our academic provision for it. I mark this omission with a full and grateful acknowledgment of initial, but admittedly tentative, steps taken by our own University College and by two or three other University institutions up and down the country.

To extending geographical horizons must be added a constantly extending technical elaboration of the methods of archaeological research. At these Sir Charles Peers has already hinted; but I would once more emphasize the need to-day for close collaboration between the Humanities and the Sciences in the study of human civilization. The history and prehistory of man is a constant process of adjustment between humanity and environment. It is scarcely to be wondered, therefore, that, as the study of civilization becomes more intensive, more detailed and more accurate, increasing need arises for the collaboration of the geologist, the botanist, the palaeontologist, the climatologist, and other workers in departments devoted to the study of the physical universe. Thus an Institute of Archaeology must, under modern conditions, be designed not merely as an addition to existing university activities but as a new means of collaboration between them.

From these general considerations, I turn to the new Institute which we are to-day inaugurating. I am told that, although I am formally opening this Institute, I am in reality only laying its foundation-stone. The building within which we are assembled is a temporary, though for the moment adequate, home for use until such time as permanent quarters may be available in Bloomsbury. For these temporary quarters, which (I may interject) the Institute rescued from a state of dereliction and decay, we are grateful to the friendly co-operation of the authorities of Crown Lands and to a sympathetic First Commissioner of Works whom we are glad to welcome here to-day in another role. Within this building, as I have already remarked, are now assembled the nucleus of a collection illustrating phases of British Archaeology and, above all, the large collection of objects found over a period of years by Sir

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Flinders Petrie in Palestine and constituting one of the largest, if not the largest, single collection of Palestinian material now assembled outside Palestine itself. For that collection we are indebted to the generosity of the British School of Archaeology in Egypt; and, if we recall that to-day more British archaeological field-work is being carried out in Palestine than in any other country outside Great Britain, the potential utility of this great collection as a university training-ground will readily be appreciated. I will take this opportunity of reinforcing the appeal recently made by the Archbishop of Canterbury and others for the endowment of a teaching-post in Palestinian or Biblical archaeology with this collection as its basis—an appeal launched with a generous initial donation from that old friend of Biblical archaeology, Sir Charles Marston. I cannot help feeling that it is a reflection upon our academic system that there are at present nowhere in this country any adequate means for giving a comprehensive preliminary training to the students who, year by year, find opportunity awaiting them in this fruitful and important field of archaeological research.

In addition to the two groups of study-material which I have mentioned, the Institute is already equipped with a practical workshop for the reparation of archaeological material; and it is fortunate in having for the time-being, as honorary Lecturer in Geochronology, the services of Dr. Friedrich Zeuner, whose special work is the correlation of physical science with human history on the lines to which I have already referred.

It will be clear from what I have said that the Institute is, at present, only in the initial stages of its growth. For that growth, further endowment is necessary and urgent. But in drawing attention to this need, I am not forgetful of those benefactors who have enabled the University to take the all-important initial step. Amongst the earliest of those benefactors I have pleasure in naming Sir Percival David, Sir Robert Mond, and Mr. A. L. Reckitt. It was, however, the intervention of Mrs. Mary Woodgate Wharrie that finally enabled the Institute to enter into the occupation of this, its first home. Mrs. Wharrie gave three separate and substantial donations anonymously to the Institute's endowment fund—the last donation being given a few days before her death last month. At the time of her last donation, Mrs. Wharrie sanctioned my announcement of her name on this occasion, and not the least of my duties to-day is the naming of one of the principal galleries of the Institute after this very gracious and generous donor. A tablet has been affixed to the wall of the gallery as a perpetual memorial to her, and will be removed to the permanent building when the time comes.

Before declaring the Institute formally open, I have one more task to perform. To the list of our benefactors must be added the name of Tessa Verney Wheeler, to whose untiring efforts as Honorary Secretary of the Appeal Committee much of what has been accomplished is entirely due. Her enthusiasm and self-sacrifice can never be forgotten by those who have been associated with her. For those who will succeed us, her memory is to be perpetuated by the memorial which I hope shortly to unveil in this room.

It remains for me to exercise the function which I am here to-day to perform, and to declare this Institute open.

A vote of thanks to the Chancellor was then proposed by the Right Hon. W. Ormsby Gore, M.P., Secretary of State for the Colonies, to whom, as First Commissioner of Works, the Institute

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had been greatly indebted during the negotiations for the tenancy of St. John's Lodge, and seconded by Dr. R. E. M. Wheeler, Honorary Director of the Institute.

The proceedings terminated by the unveiling of memorial tablets to Mrs. T. V. Wheeler, first Secretary to the Institute, and to Mrs. Mary Woodgate Wharrie, its most generous benefactor.

The Institute's Headquarters

Formerly St. John's Lodge

By ARTHUR T. BOLTON, F.S.A., F.R.I.B.A.

Curator of Sir John Soane's Museum

THE building now occupied by the Institute stands beside the Inner Circle Road of the Regent's Park, and is an interesting villa of the Regency period.

In the ninety years of its existence, the original house has experienced many changes. As first built it can be seen in a drawing by T. H. Shepherd, engraved by T. Barber, under the title *Villa in the Regent's Park, The Residence of John Maberley, Esq., M.P.*, published May 5th, 1827, by Jones & Co., in *Metropolitan Improvements* or London in the 19th Century. Text by James Elmes.

The description there given (pp. 79-80) is as follows :—

'Designed by Mr. Raffield for C. A. Tulk, Esq., late Member for Sudbury, and now the residence of John Maberley, Esq., Member for Abingdon. The villa is in the Grecian style of decoration, partaking somewhat of the Etruscan. The centre is ornamented by two piers, which support a pediment with acroteria, and include between them two pilasters of the Corinthian order. Between these, is a large lofty Palladian window. The wings project a little from the centre, and these are likewise embellished by two piers, with neat panels, and Grecian honeysuckles in the caps. Below the large window is a spacious porch of two well-proportioned piers, each supporting a lion. The centre is marked by two columns and an entablature of the Paestum Doric, with a string-course substituted for the cornices, and a blocking course in unison with those which support the lions. A belfry of rather pretty form, disfigures the design, which otherwise has animation and variety in every part, and a happy accordance between the flanks and the principal front. The house, which I have several times been over, previous to Mr. Maberley's occupation, is remarkably well built, by Messrs. Baileys, whose beautiful indurated cement, resembling the finest Portland stone, shows off the architect's tasteful design to the greatest advantage.'

Though both Shepherd and Elmes did their best, the villa was a somewhat nondescript design. Elmes throughout plays the part of an

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architectural Balaam; called in to bless, he does not allow himself to wander into cursing. The building was subsequently enlarged by Sir Charles Barry, R.A., in a very interesting way. Called upon to add a ball-room and library, he brought forward the wings of the house by 60 ft., and to counteract any excessive depth in the fore-court, formed a new entrance hall, behind a screen consisting of an arched and pedimented porch with side-loggias of Roman Doric columns. At the same time he raised the main block of the house by a storey, so that it forms an effective central mass in the background.

It is curious that Elmes, who claims to have gone over the house, is silent as to the interior, so that it is not clear whether the present inner hall, or saloon, was always two storey in height. The existing treatment, with its elegant gallery, appears to be Barry's, but the painted decoration by Poynter¹ has been added to, by H. W. Lonsdale, so that it remains open to question how much of the 1847 work has been left as originally executed. The double staircase, which led centrally off this inner hall, has also been replaced by a lateral one which has itself been partially renewed. There is no reference in Bishop Barry's *Memoir* of his father to this work, nor does it appear in the very imperfect list of his works. There are, however, some allusions to it in a building journal of the period. The first is in May, 1847, as follows:—

'It is understood that Barry has executed for the Baron de Goldsmid² a grand ball-room, which no stranger has yet seen, and the opening of which will be one of the attractions of the season.'

'It is said to be one of the best pieces of decoration in this way yet executed, and in the most magnificent style—worthy of the great capitalist and the great architect.'

¹ Ambrose Poynter was only a year younger than Sir Charles Barry, being born in 1796. He was five years in Nash's office (1814–1818), and travelled 1819–1821, starting in practice for himself on his return in Westminster. He is best remembered as the architect of St. Catherine's Hospital in the Regent's Park—a rather thin specimen of the Gothic of the period. While in Italy he made a special study of the Loggia of the Vatican, which no doubt led to his being engaged on the work at St. John's Lodge.

² The Goldsmids were a remarkable Jewish family. Sir Isaac Goldsmid, created Baron da Palmeira of Portugal in 1846, was born in London, January 13th, 1778, and died in April, 1859. He made a fortune by financing in Brazil, Portugal and Turkey. University College and the North London Hospital were much indebted to him. He was a friend of the third Lord Holland and of Robert Owen. Prison reform was another subject in which he was greatly interested. He was a Vice-President of the Royal Society of Arts.

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In the following month of June, in a notice of the Architecture at the Royal Academy, there is this further allusion to the work :—

‘ Right glad, therefore, we should have been to see here a drawing of the ball-room, which Mr. Barry has just fitted up at St. John’s Wood Lodge, for Sir Isaac Goldsmid, and which is reported to be a fine specimen of the Cinque-Cento style.’

Finally in June, 1848, a fuller description is attempted :—

‘ *Baron de Goldsmid’s House.*

‘ The grand ball-room at St. John’s Lodge in the Regent’s Park, of which so much has been spoken and written, was lighted last week for a party given by the Baron de Goldsmid.’

‘ The effect is reported to have been most admirable. Although Mr. Barry and Mr. Poynter had exerted every care, the effect of light upon the decorations must have caused them some anxiety, and it must be most gratifying to have succeeded so completely.’

‘ The richness of the gilding contributes to the grandeur of the room, without destroying its air of chasteness, and if Mr. Barry be reproached that there is a want of repose in the House of Lords, and too great profusion of ornamentation, the same objection cannot be made against a ball-room. This saloon is the great work of the present season, and it is pleasing to learn that the munificent patronage of the Baron de Goldsmid has been, as usual with him, displayed in the encouragement of English artists, instead of being lavished upon foreigners, as is too common with our nobility.’

This ball-room which excited so much interest, presents to-day only the shell of its former magnificence. The recessed folding entrance doors, 8 ft. wide by 4 ft. deep, are the only completely preserved portion of the original painted decoration. The ball-room is 58 ft. by 26 ft. wide, and about 20 ft. high. The ceiling is framed into a long panel by cross beams, the three large panels thus formed having hexagonal top lights. Along one side was a conservatory framed up with Doric pilasters, with a curved glass roof, which retains the original glazing. This conservatory was partitioned off while the house was occupied as a hospital during the War. The fine parquet floor of the ball-room exists, as well as the interesting bold marble mantel-piece, which is 9 ft. in length and 5 ft. in height.

There is an elaborate cornice to the room, but the frieze seems to have received later insertions.

The corresponding library in the other wing is now very plain and appears to have been altered as it would appear that there were cross screens of columns, since removed. The well-known interiors

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of the Reform Club indicate the probable character of the original. There is a good plain marble mantel-piece of Barry's design.

The exterior of St. John's Lodge as we see it to-day is an unmistakable example of Sir Charles Barry's work, showing his complete mastery of the elements of the Italian style. It was obviously undesirable to have windows in the side walls of the ball-room and library wings, which form the forecourt. This difficulty is overcome by an ingenious disposition of panels. The ends of these wings are given importance by large Venetian windows grouped with enclosing arches flanked also by bold panels. Effective ornament of a Roman character, possibly executed by the same carver who worked on the rich frieze of the Treasury-building in Whitehall of the same date, provides just the right degree of restrained enrichment. The older part of the house was left largely untouched, being skilfully incorporated in the general design.

POSTSCRIPT.—Mr. Robert W. S. Weir has kindly added the following notes on alterations carried out during the tenancy of the house by the late Marquess of Bute.

In 1892 the small library and circular Chapel were added.

In 1893 to 1895 the garden was entirely reconstructed. The building work connected with this included the formation of the courtyard with the stone piers and figures on top of them holding shields on which were painted the various arms of the Bute family, the terrace walls and railings, the circular stone fountain, the portico and the apse at the end of the vista. The terrace on the west side of the house was also formed, having a long path with a sundial in the centre, benches on a semi-circular stone platform at one end, and a covered loggia adjoining the dining-room. During the intervening years various alterations were made in the interior of the house. The inner end of the dining-room was re-arranged and a recess formed with pillars, and mahogany double doors opening into an ante-room to the great library. On the left hand side of this a small octagonal hall was formed leading to the staircase. Some alterations were also made to the staircase. The painted decoration in the hall and staircase was carried out from the designs of H. Walter Lonsdale, and were not entirely finished before the death of Lord Bute. A certain number of decorated glass panels bearing arms were designed by the same artist and were placed in the windows of some of the principal rooms.

Report on Routine-Work, 1937

THOUGH the Institute of Archaeology was constituted in the autumn of 1935 and existed as a University body from that date, it was not until October, 1936, that it entered into possession of its quarters, formerly St. John's Lodge, in the Inner Circle, Regent's Park, and it was not formally opened until April, 1937. The building, the history of which is outlined above, is admirably suited for the work of the Institute. On the ground floor are two large and two small rooms used as galleries, two libraries, the larger of which is also used as a lecture room, three rooms used as offices and an annexe used as a repair workshop. The first floor provides a number of rooms for the use of archaeological expeditions and the Geochronological Department. On the second floor are the caretaker's quarters, while in the basement there is accommodation for the storage of specimens, together with a photographic studio and dark room.

STUDENT COLLECTIONS

The primary function of the Institute is to house student-collections, and in the course of the winter of 1936-7 much work was done in their classification and arrangement. The largest single collection in the Institute is that presented by the British School of Archaeology in Egypt, from Sir Flinders Petrie's excavations in Palestine (see p. 24). This collection had been housed in the cellars of University College, London, for ten years or more, and for the most part had never been unpacked in England owing to lack of accommodation. It forms an invaluable basis for instructing students in the pottery of South Palestine from the beginning of the Middle Bronze Age (*c.* 2000 B.C.) to the beginning of the Hellenistic period (*c.* 300 B.C.). It has now been unpacked and arranged in the two principal galleries by tomb- or stratification-groups, in chronological order. The greater proportion of the tomb-groups are in glass cases, as they consist of comparatively complete pots, while lesser groups, sherds from stratification-levels and objects such as beads and scarabs are arranged in trays in cabinets beneath.

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The other principal collections at the Institute consist of loan collections from excavations of Iron Age and Roman sites in Britain. These have been arranged on a similar plan.

In the sphere of the Institute's activities, therefore, work has largely been confined to arrangement, though some incidental instruction was given to students in the course of this. The collections are now being catalogued, and thus made completely accessible to students, and they will be employed in connexion with courses during the present session.

EXPEDITION HEADQUARTERS

The use of the Institute as the winter-headquarters of various expeditions is now fully established. During the past year expeditions working on a number of British sites (Maiden Castle, Leicester, Wroxeter, Angmering and Hedgerley) have used the Institute as a 'clearing house,' while a suite of four rooms and considerable storage accommodation have been allocated to the Wellcome-Marston Expedition to the Near East. A limited amount of accommodation of this sort is still available, at low fees.

GEOCHRONOLOGICAL DEPARTMENT

An office and library space on the ground floor, and two work-rooms on the first floor, have been allotted to the Geochronological Department. A description of the work of this department appears elsewhere (p. 29).

LECTURES

As soon as the building was in working order, courses of lectures were arranged in the big library, which will accommodate 150 persons. The lectures, of which a list is given below, were in some cases designed purely for archaeological students, in others for a wider public. The former were attended by about twenty students, while the average attendance at the latter was fifty.

LECTURES HELD AT THE INSTITUTE DURING THE SESSION 1936-7.
February-March, 1937. An introductory course of three public lectures on *Geochronology*, by Dr. F. E. Zeuner.
March, 1937. A course of six lectures on *Archaeological Draftsmanship*, by Mr. G. C. Dunning, F.S.A.

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May-June, 1937. A course of five lectures on *Some Technical Aspects of Archaeological Field-Work*.

Dr. R. E. M. Wheeler, F.S.A., on *Roman Constructional Methods*.

Mr. B. H. St. J. O'Neil, F.S.A., on *Principles of the Identification and Significance of Coins in Field-Work*.

Miss D. Parker on *Treatment in the Field of Archaeological Objects*.

Mrs. J. W. Crowfoot on *Primitive Techniques of Making Pottery*.

Dr. T. Davies Pryce, F.S.A., on the *Use of Samian Pottery in Roman Excavations*.

May-June. *Recent Work in Near Eastern Archaeology*.

Miss W. Lamb, F.S.A., on *Prehistoric Anatolia*.

Mr. T. Gaster on *The Ras Shamra Inscriptions*.

Mr. J. W. Crowfoot, F.S.A., on *Early Churches in the Near East : Recent Discoveries*.

Mr. J. L. Starkey, F.S.A., on *Recent Work at Tell Duweir, Palestine*.

LIBRARY

The task of building up an adequate reference-library is necessarily a slow one, and relevant contributions are earnestly invited. A useful nucleus of works on Britain, including the reports of many local societies, is available in the library of the British Archaeological Association, which is housed at the Institute ; whilst the Royal Archaeological Institute has also arranged to deposit its library there, and the Society of Antiquaries has generously agreed to give all its publications. From these and other sources, the library has thus obtained a considerable number of useful periodicals, but is still seriously deficient in standard works. On the subject of Near Eastern Archaeology, a number of purchases have been made, and the library of the Iraq Society, which is housed at the Institute, is available to students, together with the private library of Mr. Oliver Myers. A series of books on cuneiform has recently been added by Mr. W. W. Skeat.

REPAIR LABORATORY

This department occupies an annexe on the ground floor. It undertakes the repair of pottery, the treatment of archaeological objects of all sorts and the construction of archaeological models. In the past year a great quantity of pottery from the Institute's



METAL STORAGE-CABINET AND CASE DESIGNED FOR THE INSTITUTE
(Height over all, 6 ft. 3 in.)

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collections, especially the Petrie Collection, has been repaired here, and a number of the metal objects from the same collection treated. Besides this, pottery of all periods from the Bronze Age to medieval times has been repaired and restored for various expeditions and museums, and scale-models made of subjects ranging from sections of ditches and Iron Age pits at Maiden Castle, to Roman shops at Housesteads. Tuition has also been arranged in these various branches for a number of students, some of whom took the long course lasting a month, and some the short course lasting ten days.

PHOTOGRAPHIC LABORATORY

Through the generosity of Sir Robert Mond, a photographic department with a full-time technical assistant was established in August. The task of converting two rooms in the basement into a dark-room and studio is now complete, and work of all sorts can be undertaken. The photographer has been fully occupied during the summer on a number of excavation sites, having been employed by eight excavation committees. Work on prints and slides and the photographing of objects from these excavations will continue during the winter ; and instructional courses in archaeological photography are now in progress.

STUDENTS

When the Institute was first established, it was emphasized that it would not compete with other University of London bodies which already provide training for degrees and diplomas in specific subjects ; it would only organise such training in branches where it was not already provided, and in other branches would merely house the materials necessary for such teaching. For this reason, the number of students registered with the Institute for the purpose of a degree or diploma will always be small. During the year, two students have been registered at the Institute for a diploma in Palestinian Archaeology, which is one of the subjects not taught elsewhere. The majority of the students working at the Institute have been receiving instruction in the various other subjects recounted above, which are not taught elsewhere, and are in the main connected with field-archaeology.

TRAINING IN FIELD-WORK

A department of archaeology which has up to now lacked organization is the training of students in actual field-work. This

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deficiency the Institute has endeavoured to make good by registering all such students who applied to it, advising them on the kinds of 'digs' available, and arranging with directors of excavations to give work and instruction on the type of sites required. Twenty-two new students, apart from those who had already had some experience, took advantage of these facilities.

CONCLUSION

This summary indicates that, even in its first year of active life, the Institute has been fully employed. Its activities may be summarized as follows : in the winter it has provided accommodation and facilities for directors of excavations and research-workers, materials for instruction for students, and lectures for these and the general public, while in the summer its activities have been concentrated chiefly on work in the field. Further, in its Department of Geochronology, its repair-workshop and its photographic studio, it is now undertaking work for museums and expeditions, either free or at minimum charges, and is endeavouring in these and in other directions to make itself generally useful to the expanding science of archaeology.

The Study-Collections

I. CASES AND CABINETS

THE greater part of the collections is housed in storage cabinets specially designed for the Institute. These consist of steel cupboards 3 ft. 3 in. high (including a 3 in. plinth), 3 ft. long and 2 ft. deep, with close-fitting doors supplied with lock and key. The interior is fitted with plain angle runners spaced at 2 in. interval. These runners are continued on the doors of the cupboards, which are fitted with quadrants to prevent them from opening beyond a right angle. The runners take metal trays of plain box construction, with a turn-up all round of just under 2 in., provided with three card holders punched out in front. The whole is stove-enamelled olive green. (See plate.)

The advantages of this design are that trays can be placed at any intervals, some being immediately adjacent to take coins, scarabs, etc., and others at wide intervals to take large pots, thus preventing wastage of space which is inevitable in any fixed arrangement. The doors of the cupboard keep out dust so that the fact that the drawers are uncovered does not matter. The trays can be drawn right out on to the doors for examination, a feature which adds considerably to the convenience and safety of their use. They are also interchangeable from case to case. Subdivisions of the individual trays have been provided by cardboard trays of dimensions varying from four to fit each metal tray, for pottery groups, to small pill-boxes for scarabs, beads, etc.

These cabinets have been found to be entirely suitable for the purposes of the Institute. They have enabled a great quantity of pottery to be stored in an accessible way, and re-arrangement is easy owing to the flexibility of the system.

The glass cases designed to fit over these cases are 3 ft. high, 3 ft. long and 1 ft. 6 in. deep. They are fitted with lugs at the sides and back, to clip over the cupboards and prevent them from sliding about. The back and top are metal, and sides and front are glazed with single sheets of glass. The interior is fitted with two glass shelves on movable brackets.

THE STUDY-COLLECTIONS

II. ACCESSIONS PRIOR TO DECEMBER, 1937

A. NEAR EAST

1. The Sir Flinders Petrie collection of Palestinian pottery, from the following sites :—

(a) *Tell Jemmi*

Groups of sherds and small finds from the excavations of the Tell, arranged in levels above sea-level. These include a very few of the Middle Bronze II period, and some of the Late Bronze Age, but the great majority are of the Early Iron Age down to c. 600 B.C., with a few later sherds.

(b) *Tell Fara*

A large number of tomb groups from the second half of the Middle Bronze II period (17th century B.C.) down to c. 800 B.C. Groups of sherds from the Tell excavations from the 17th or 16th centuries to the same date, with a few from the Hellenistic and Roman periods.

A large collection of palaeoliths, collected from the surface in the neighbourhood.

Groups of flint implements and sherds from a series of sites excavated in the neighbourhood of Tell Fara, dating from the Neolithic, Chalcolithic and Early Bronze periods.

(c) *Tell Ajjul*

Finds from the first two seasons' work only. The tomb groups include a few good groups of M.B. I (Early to Middle Bronze Age), while the main groups run from the beginning of M.B. II (c. 1800 B.C.) to the first half of the Late Bronze Age, i.e. about the 14th century B.C., with a few isolated Early Iron Age tombs. The finds from the Tell include those from the series of superimposed palaces from the 18th to the 15th centuries, as well as from the surrounding areas of approximately the same date.

2. From Samaria, Palestine, a small series of representative sherds of the six Early Iron Age II levels (the first being transitional from E.I.A. I-II), between 880 and 720 B.C., and succeeding levels down to 4th century A.D.
3. From the Mugharet el Tabun, Wadi Mughara, Palestine, a type-series of the Upper Acheulean to the Mousterian periods.

THE STUDY-COLLECTIONS

4. From Jericho, Palestine, a small series of implements from the Early, Middle and Late Neolithic and Early Bronze Age levels. Given by the Sir Charles Marston Expedition (Professor J. Garstang).
5. From Chagar Bazar and Brak, Northern Syria, a collection of pottery. The expedition was under the auspices of the British Museum and of the British School of Archaeology in Iraq and received the support of the Institute of Archaeology and other subscribers ; it was led by Mr. M. E. L. Mallowan, who has kindly supplied the following note.

In the course of the 1937 season the Expedition completed the excavation of the top levels of Chagar Bazar. The most important discovery was a 'Record Office' in which were seventy cuneiform tablets containing over two thousand lines of cuneiform script, written between 1800 and 2000 B.C. The tablets are chiefly corn accounts and seem to show that the province was then under the dominion of Assyria, though the names of the months are Babylonian.

At Brak, the largest mound in the Eastern Habur region, the Expedition discovered a Palace founded in the Sargonid period, c. 2600 B.C. The Palace was purely Sumerian in ground plan and private houses of the same period proved that Brak was predominantly influenced by the civilisation of Sumer down to the end of the third millennium B.C. Brak produced a rich collection of antiquities ranging from prehistoric times down to about 1500 B.C.

The Expedition will resume work in March, 1938, and the principal task will be to complete the digging of the Palace, at present only half excavated, and to finish the excavation of the Sargonid houses. Work will also be continued on an outlying portion of the mound where there are specimens of the so-called 'Hurrian pottery' with white-on-black painted designs.

6. From Sir Leonard Woolley's excavations in Northern Syria, a collection of pottery received through the generosity of Sir Percival David, Bart. Sir Leonard Woolley has kindly supplied the following note.

The Expedition was engaged on two mounds in North Syria, one, *al Mina*, on the sea-coast at the mouth of the river Oontes, the other, *Atchana*, in the Amk plain on the road leading from Antioch to Aleppo. *Al Mina*, perhaps the ancient Posidium, was

THE STUDY-COLLECTIONS

the port through which passed the traffic between Greece and Asia ; the ruins gave a continuous record of commercial intercourse from the 8th century B.C. until the death of Alexander the Great. During the whole time the merchants were dealing only in goods of the best quality available ; in the earlier period their markets were in the Greek islands generally, then Cyprus obtained a predominant position which was soon contested by Rhodes, while other centres of production such as Lesbos, Naukratis and Corinth had their share of trade. About 520 B.C. Athens secured a monopoly of the export trade to Persia and held it throughout the whole critical period of the Persian wars. The port was abandoned about 300 B.C., owing to the establishment of the new harbour of Seleucia, and was only revived in the Middle Ages, to become the *Port de S. Simeon* of the Crusaders.

The excavation of the site, now concluded, has produced a very remarkable collection of Greek pottery and a representative series is to be deposited in the Institute of Archaeology ; from the historical point of view it has thrown new light on Greek economics and on the sources of the Oriental influences apparent in Greek art.

The second site, *Atchana*, has in the initial stages of the work produced evidence of earlier connections between Greece and Asia. In the upper levels Late Mycenaean pottery is abundant, associated with Cypriote wares of the Bronze Age, and in this connexion are found cuneiform tablets of about the period of the Tell el Amarna letters. In the fourth level which is the lowest yet reached, there is a palace definitely Hittite in type yet possessing marked affinities to the buildings of Minoan Crete ; in this, as in levels two and three, there occurs a richly decorated pottery which is local in manufacture, often identical with the so-called 'Hurrian' pottery found in the Harbour valley and as far to the east as Nuzi, beyond the Tigris, but sometimes astonishingly like Minoan Cretan wares. The palace, of which only a small part has been excavated, is well preserved and rich in pottery of all sorts and has already yielded objects in ivory and gold and inscribed tablets of the 16th century B.C. of great historical importance.

The next season, which should start about March 1st, 1938, will be devoted to the clearance of the palace and surrounding buildings ; contributions made to the work in the name of the

THE STUDY-COLLECTIONS

Institute of Archaeology have assured for the Institute a collection of North Syrian material which should be invaluable for students.

7. From Ur, Iraq, a number of stone and pottery vessels of various periods, including some from the Royal Cemetery. From Sir Leonard Woolley's excavations; given by the British Museum.
8. From Cyprus, a collection of pots from the Early Bronze to the Iron Ages, the majority being of the Early and Late Bronze Ages.
9. From Egypt, a loan collection, from Mr. Oliver Myers, of Arab ring-bezels, Arab beads and glass bangles, mainly purchased. Also a group of Arab pottery from Armant, and of pottery and porcelain (Ming, K'ang Hsi, Chin, Sung) from a Cairo rubbish-pit of A.D. 14th-18th century.

B. GREAT BRITAIN AND WESTERN EUROPE

10. A collection of material, mostly palaeolithic, from the Essex coast at and near Clacton has been presented by its finder, Mr. S. Hazzledine Warren.
11. The Belgic and Roman collections from Verulamium and Wheathampstead, Hertfordshire, are deposited in the Institute pending the transference of the major part of them to the new Verulamium Museum now under construction at St. Albans.
12. Most of the materials (Neolithic, Early Iron Age and Roman), from the recent excavations at Maiden Castle, Dorset, are stored at the Institute for the time being, and are available for study.
13. Smaller collections from the Iron Age sites of All Cannings Cross and Casterley Camp, Wiltshire, Alfred's Castle, Berkshire, and elsewhere, are also included in the collection.
14. 'Vitrified' or heat-fused material from the rampart of the Iron Age site of Dunagoil, Bute, has been presented by Miss Dorothy Marshall for comparison with material of a similar nature recently produced experimentally by Mr. Wallace Thorneycroft.
15. An extensive collection of sherds, implements and shale objects from stratified deposits at Kimmeridge Bay, Dorset, has been presented by Dr. Henrietta Davies, to illustrate the pre-Roman and Roman shale industries at that place. (See *Archaeological Journal* xciii (1937), 200 ff.)

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16. Moulds and *terra sigillata* from the Gallo-Roman pottery-kilns at Lezoux, France. Given by Dr. Felix Oswald, F.S.A.
17. Pottery, etc., excavated from the Early Iron Age camp of Salmonsbury, Bourton-on-the-Water, Gloucestershire. Lent through Mr. G. C. Dunning, F.S.A.

C. GENERAL

18. The important Karl Pearson collection of casts of anthropological material, including a large number of reproductions of Pleistocene skulls, is deposited in the Institute.

The Department of Geochronology

REPORT FOR 1937 BY DR. F. E. ZEUNER

(Lecturer in Geochronology)

I. GENERAL REPORT

LABORATORY

THE time from January to July, 1937, was largely spent in the installation of the laboratory which has been equipped in part through the generous help of Sir Robert Mond. Apparatus has so far been provided for mechanical analysis and for gravel analysis.

The apparatus for mechanical analysis consists of :—

- (1) a chemical balance with chain-drum, for weighing samples,
- (2) a shaking-machine with small electric motor, to disperse samples previous to analytical treatment,
- (3) a Kopetzky elutriator, }
- (4) two Atterberg cylinders, } to be used alternatively for analyses,
- (5) an electric drying-oven, to dry the obtained grades before weighing, and for similar purposes,
- (6) various additional glass and china apparatus.

The apparatus for gravel analysis consists of :—

- (1) one set of large sieves, 12 in. diameter, with lid and receiver, the apertures of the squares being :—
 $\frac{3}{8}$ in. = 9 mm. appr.,
 $\frac{3}{16}$ in. = 4.5 mm. appr.,
 $\frac{1}{8}$ in. = 3 mm. appr.
- (2) one set of smaller sieves, 8 in. diameter, with lid and receiver, the apertures of the squares being :—
 2.03 mm. (10 mesh),
 0.92 mm. (20 mesh),
 0.57 mm. (30 mesh),
 0.19 mm. (70 mesh),
 0.11 mm. (120 mesh).

In order to avoid unnecessary expense, sieves of British manufacture were taken. They are better made in several respects, and

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less expensive, than foreign ones. They do not, however, use the millimeter system. The selected sieves approach as closely as possible those formerly used by me, and I am confident that the results will be comparable with those obtained with other sets, especially if graphs are used to reproduce the results.

The drying-oven will be used for work on gravels also. This oven, as well as the other subsidiary apparatus, might eventually prove to be useful for occasional work in other departments of the Institute.

LIBRARY

My geological library containing about 3,000 books and pamphlets on geology (particularly geochronology and Pleistocene) palaeontology (particularly faunas of the Pleistocene), and pre-historic archaeology, is now housed in the lecture room of the Institute and available for reference.

In addition, several books required for work in the Department have been bought with the aid of the Sir Robert Mond fund.

EXCURSIONS

Excursions were made in order to study important sections, chiefly in East Anglia, and to provide material for analytical investigation, for exhibits, and for the reference collection.

March 6th : Rothamsted Experimental Station, to view the apparatus used there for mechanical analysis.

April 22nd : Clactonian and Neolithic sites of Jaywick near Clacton, with Mr. Hazzledine Warren.

May 17th : Implementiferous gravels of the Taplow-Rickmansworth district, with Mr. K. P. Oakley.

May 28th, 31st, June 1st, 4th, 9th, 11th : Neolithic-Bronze Age sites of Stone Point, Walton-on-the-Naze.

May 29th, June 9th : Pleistocene cliff section of Walton.

June 2nd, 7th : Clacton Channel and Neolithic-Bronze Age sites of Lion Point, Clacton.

June 3rd : Lower Kirby near Walton.

June 10th : Pleistocene gravels of Holland-on-Sea.

July 25th : Cheddar Caves and Wells Museum.

July 26th : Burrington Coombe Caves, Mendips near Bristol.

September 2nd : Maiden Castle, sections of fossil soils.

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September 9th—October 6th : Expedition to Italy and France.

December 9th : Brickearth sections at Northfleet, with Mr. F. P. T. Burchell.

COLLECTIONS

Geological and archaeological material was secured on these excursions. It has been used to form a reference-collection for teaching geochronology and studying the relations of early man to his environment. It is intended to enlarge these collections in the course of time.

At present the following collections are available for research, instructional courses, and for exhibits :—

- (1) Twenty drawers of Pleistocene and other materials for palaeoclimatic research and for the compilation of exhibits.
- (2) A complete set of samples from the sections enclosing the Clactonian and Neolithic-Bronze Age-sites of Lion Point near Clacton, and a series of implements.
- (3) A complete set of samples, and implements, from the coast sections enclosing the Neolithic-Bronze Age-sites of Walton-on-the-Naze, and of the underlying Pleistocene deposits.
- (4) A series of samples from various loess sections in North France, and of implements, showing the relation of the Palaeolithic industries to the climatic phases of the Pleistocene.
- (5) A similar series from Italian caves and open-air sites, and a collection of (chiefly) Mousterian and Aurignacian flints.

EXHIBITS

Three exhibits illustrating methods used in geochronological work (tree-ring analysis, gravel analysis, mechanical analysis) were prepared for the official opening of the Institute on April 29th. These exhibits have subsequently been supplemented and transferred to permanent cases in the lecture room.

Another exhibit showing a geological section containing Palaeolithic and Neolithic levels, from the coast of Essex, is in course of preparation.

LECTURES

An introductory course of three lectures on Geochronology was given at the Institute from February 23rd to March 2nd. A second, somewhat different course of four lectures was delivered from

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November 17th to December 8th. On invitation, I have further delivered the following lectures in places outside the Archaeological Institute :—

January 26th : Palaeobiology and Climate (University of Leiden, Institute of Geology).

January 27th : Palaeobiology and Climate (University of Amsterdam, Institute of Geology).

January 28th : Fauna of Solnhofen (Technical Highschool of Delft, Institute of Geology).

February 8th : The climate of the countries surrounding the ice-sheet of the Pleistocene (Bedford College, University of London).

February 22nd : Some aspects of evolution revealed by the study of fossils (Bedford College, University of London).

July 26th : Prehistoric cultures and climatic fluctuations (Spelaeological Conference, Bristol).

ENQUIRIES AND VISITORS

Twenty-two geochronological enquiries were received from outside the Institute and dealt with, and considerable time was spent in analysing submitted samples and providing the required information.

Seven colleagues from the Dominions and foreign countries visited the Department.

II. RESEARCH

PUBLICATIONS

The following papers have been published during the year 1937 :—

- (1) 'A Comparison of the Pleistocene of East Anglia with that of Germany.'—*Proc. Prehist. Soc.*, 1937, pp. 136–157.
- (2) 'The Climate of the Countries adjoining the Ice-sheet of the Pleistocene.'—*Proc. Geol. Assoc.*, London, 1937, pp. 379–395.
- (3) 'The Relations of the English and French Pleistocene to the Diluvium of Germany.'—*Verh. III. int. Quart.-Konferenz (Inqua)*, Vienna, September, 1936, vol. II, 4 pp.

The following paper is in the press :—

- (4) 'The Chronology of the Pleistocene.'—Serbian Academy of Sciences, Belgrade. (To be published in two editions, one in German, one in Serbian.)

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PRELIMINARY REPORT ON THE EXPEDITION TO ITALY AND FRANCE, SEPTEMBER–OCTOBER, 1937

In recent years, the problem of correlating the Palaeolithic of Mediterranean regions with that of Europe north of the Alps, has become increasingly important. In order to avoid the common mistake of dating geological layers with the aid of the contained industries instead of determining the age of the industries by geological means (thus anticipating the result without having proved its correctness), it is advisable to study those sections which, at the same time, show industrial layers as well as a record of geological events as complete as possible. Such 'standard sections' enable one to determine geologically the relative age of industries. This having been done it is possible to see whether each industrial phase was contemporary over a wide area, or not; whether different industries existed at the same time, and which were the direction and speed of industrial migrations. These standard sections, naturally, are very few, but from a geochronological point of view it is more essential to study them than to study other sites where the geological position of the artifacts is not clear or where the record of geological events after the deposition of the industrial layer is not sufficiently complete.

The expedition was undertaken to study a number of standard sections in France and Italy and to compare them with others in Germany and England, in order to spread a network of reliably correlated localities over Central, West and South Europe which, in turn, is the essential basis for an absolute chronology in years.

A great number of places were visited; among many others in France and the Italo-French Riviera: St. Pierre-les-Elbeuf (Seine), St. Acheul (Somme), Grotte de l'Observatoire (Monaco), Grimaldi Caves (Mentone); in Italy: the Bassa Versilia (Tuscany), the Pontine Marshes near Rome, Chellian of Capri, Grotta Romanelli (Apulia) Acheulian and Tayacian sites of Venosa (Basilicata).

The expedition which was made possible by equal contributions from the Sir Robert Mond fund for geochronological research and from the British Museum (Natural History) (the latter for insect-collecting), lasted from September 9th to October 6th. I am greatly indebted to a number of friends without whose assistance the studies would not have successfully been carried out, above all to Baron A. C. Blanc who accompanied me for the largest part of the Italian itinerary, also to M. Harper Kelley of Paris, to the abbé H. Breuil, and many others.

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The results of the expedition are at present being worked out in the Department, the samples have to be analysed and theoretical investigation to be carried out. At the present moment it is already possible to say that the idea of working southwards in small geographical steps from standard section to standard section, has proved to be sound. I was able to convince myself that the pluvial phases of the Mediterranean region can chronologically be correlated with climatic fluctuations in North Europe though not in the simple and often used way of homologising pluvial and glacial phases directly. It was also found that a reliable relative time-scale for the Mousterian and Upper Palaeolithic industries can be composed linking the Mediterranean with North Europe, that the eustatic falling and rising of the sea level is connected with climatic fluctuations (here, A. C. Blanc's work deserves special mention), and that it will be possible to date in years in the Mediterranean region, too, on the basis of the radiation curves. The combination of the last two points opens a chance to extend absolute dating over wide distances. I hope shortly to publish a more detailed account of the results, some of which will also form the subject matter of a course of lectures in the third term, 1938.

LABORATORY RESEARCH

The first six months were largely devoted to the installation of the laboratory, work in which was taken up in July. The following short introductions into some analytical methods might help to explain the analytical results recorded below. They also may serve as explanatory notes for the permanent exhibits in the lecture room of the Institute.

(I) *Mechanical Analysis*

Mechanical Analysis serves to separate sands, loams, brick-earths, etc., into individual grains and to determine the different grades of coarseness present. Several designs of elutriation apparatus can be used for this purpose. They all work on the principle that, in the suspension of a certain quantity of material in water, the coarser and therefore heavier grains will settle down more rapidly than the finer ones.

The samples have to be dispersed before they are treated in the elutriators. Of the various methods applied for this purpose, dispersal by shaking with distilled water has proved to be the most advisable

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for our investigations. The sample is shaken for about twenty-eight hours with a period of about 100 movements per minute.

The most reliable elutriator is still the Atterberg sedimentation cylinder, though it is not everywhere used in laboratories in view of its extreme slowness. Its advantages over the other systems are that (1) the grades are obtained separately and are thus available for microscopic examination, (2) the clay grade (<0.002 mm.) is also caught, (3) the least trouble is experienced by whirls and unwanted currents in the water. One analysis, however, sometimes takes a fortnight to complete.

Elutriators which work with the aid of flowing water, are less accurate though quicker than the Atterberg cylinders. An elutriator as designed by Kopetzky, with four vessels, is fitted in the laboratory, and experiments are being carried out to determine the degree of reliability of this apparatus as compared with the Atterberg one.

It has been found that the division into grades which yields the best results bearing on the origin of the material, is as follows :—

GRADE.	DIAMETER.	PERIOD OF SUBSIDENCE.	HEIGHT OF SUBSIDENCE.
V	>0.067 mm.	<75 sec.	30 cm.
IV	$0.03-0.067$ mm.	75 sec.	30 cm.
III	$0.008-0.03$ mm.	5 min. 48 sec.	30 cm.
II	$0.002-0.008$ mm.	1 hour	20 cm.
I	<0.002 mm.	24 hours	30 cm.

If necessary, grade V has to be subdivided by means of sieves.

Mechanical Analysis is a convenient method to determine the origin of fine-grained sediments, i.e. of fine sand, silt, loam, brick-earth, etc. In many cases it is possible in this way to find out whether such sediment was deposited by wind or by water, and whether it was subject to secondary weathering. Mechanical analysis has thus proved to be an important help in the investigation of geological sections containing archaeological remains, since it often enables one to state not only details concerning the climatic conditions under which man lived at the time the deposit was formed, but also concerning the climatic and environmental changes that occurred afterwards. This, in turn, is important for dating.

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Investigations which were begun under my direction in the Freiburg University Institute of Geology, and carried out by Dr. W. Fauler, have shown that, if sediments which do not merely consist of clay and in the average are finer than 0.1 mm. (these are just the brickearths, many loams, etc.), contain the grade 0.03–0.067 mm. in considerable quantities, they must be wind-blown, because of the different rates of subsidence in air and in water. This critical grade is rapidly deposited from almost quiet air, whilst in water it remains suspended for a considerable time.

In analytical practice, therefore, a sediment deposited from air proves to be composed of 75 % or more grains 0.01–0.07 mm., whilst fluviatile sediments show a more equal distribution in the respective grades. This is illustrated by the following table in which they are compared :—

- (a) A recent wind-blown dust collected after a dust storm, from the surface of snow, near Breslau, Germany.
- (b) A Pleistocene loess from Gnadenfeld, Silesia, Germany.
- (c) A river silt from Stuttgart, Germany, which to the naked eye looks similar to a loess.

	RECENT DUST, BRESLAU.	LOESS, GNADENFELD.	RIVER SILT, STUTTGART.
>0.07 mm.	14.05 %	3.2 %	33.3 %
0.07–0.01 mm.	83.14 %	80.8 %	57.1 %
<0.01 mm.	2.87 %	16.0 %	9.5 %
	<hr/> 100.06 %	<hr/> 100.0 %	<hr/> 99.9 %

These figures show that wind-blown sediments are well distinguished from fluviatile deposits even if they look alike to the naked eye, and that mechanical analysis provides a suitable means to determine at least one of the factors governing environment of early man. Indeed, the importance of mechanical analysis for investigations on the origin of fine-grained sediments was recognised long ago. The method is amply used in agricultural soil science, and more than once authors have undertaken to apply it to geological problems. With a few exceptions, however, methods have been unsatisfactory, and the selected grading has not allowed the establishment of sound conclusions. It is evident from the above table, that if other limits

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for the grades are chosen, the typical composition of a loess might be completely obscured. It is, therefore, essential to use a reliable method which yields all the mentioned grades which experience has shown to be the critical ones. It is fortunate that Dr. Fauler was able to detect the reasons why the grading recommended here, and no other one, yields the best results.

Apart from the determination whether a deposit is of fluvatile or of aeolian origin, the weathering can be investigated with the aid of mechanical analysis, especially if supplemented by simple chemical work as for instance the determination of calcium carbonate or of the concentration of hydrogen-ions (pH). As a rule, the readily soluble substances are washed out by weathering so that the colloidal substances contained in the layer become more highly dispersed. Consequently, the amount of finest material is higher in the weathering horizon than it is in the unweathered stratum. This is well illustrated by the following section, which shows a loamy weathering horizon formed on a loess, and covered by another loess (analyses by W. Fauler) :—

	NO. OF SAMPLE.	PERCENTAGE.
Younger Loess 2	72	6.89 %
	71	7.49 %
	70	5.65 %
	69	5.24 %
Loam	68	14.26 %
	67	22.10 %
	66	13.65 %
Younger Loess 1	65	10.67 %
	—	—
	64	7.62 %
	63	4.37 %

Grades I + II of a loess section from Fautenbach, Baden, South-west Germany, showing increase in the loamy weathering horizon which was formed in the interstadial between the glacial phases Würm 1 and Würm 2.

In other words, this section shows that a change from cold and dry steppe conditions (with wind-action, deposition of loess) to humid and temperate conditions (with chemical weathering) took

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place and was followed, after some length of time, by another cold and dry steppe phase (deposition of the second younger loess). In this way, unmistakable evidence has been brought forward that in Central Europe the Würm glaciation was composed of two major cold phases separated by an interval with a more humid climate, and that the second cold phase was followed by a third though much weaker cold phase. The bearing of such results on prehistory is obvious : the first Würm loess contains Mousterian ; the Aurignacian lies on its weathered surface but is covered by the second Würm loess. The Magdalenian appears in the second Würm loess, and its earliest stages are thus contemporary with the second phase of the Würm glaciation.

Provided the sections are good and rich in strata, very detailed climatic sequences can be reconstructed in this way, and important climatic fluctuations found which hitherto have been overlooked or confused with others. A record, which is as complete as possible, of the climatic fluctuations is evidently necessary to arrive at a general *relative* chronology of deposits containing remains of early man and this, in turn, is the essential basis for absolute dating.

It is remarkable that the climatic fluctuations found by studying sections of loess and fine-grained river-deposits, are the same as those revealed by gravel-analysis and the study of river-terraces. The most outstanding result is that all the glaciations consisted of two major cold phases, and that these phases agree even in details with certain fluctuations of the solar radiation during the last 600,000 years. This offers a way of arriving at absolute figures for the ages of early human industries, as I have recently shown in a paper in the *Geological Magazine*.

It must, however, be emphasised that irrespective of the *absolute* scale applied to the *relative* chronology, the latter has to be worked out in any case, and this is done by means which are independent of those which are employed to obtain the absolute time-scales.

Mechanical analyses finished up to December 31st, 1937 :—

A. Sandy loess from 'Wanne,' near Wasenweiler, Kaiserstuhl Mountains, West Germany.

Grade	I :	<0.002 mm.	5.6 %
	„	II :	0.002–0.01 mm.	..	3.0 %
	„	III :	0.01–0.03 mm.	..	5.0 %

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Grade IV :	0.03–0.07 mm.	52.0 %	} 83.4 %
,, V :	0.07–0.1 mm.	31.4 %	
	0.1–0.2 mm.	2.8 %	
	0.2–0.5 mm.	0.1 %	
				99.9 %	
Calcium carbonate 30.1 %					

This is a very pure aeolian deposit which, however, is coarser than ordinary loess, the grades from 0.03–0.1 mm. containing 83.4 % of the total. In ordinary loess most of the material is contained in the grades 0.01–0.07 mm. This analysis has been mounted and is shown in the exhibit on mechanical analysis in the lecture room.

B. Loess from Gnadenfeld, Upper Silesia, Germany.

Grade I :	<0.002 mm.	7.6 %	} 80.8 %
,, II :	0.002–0.01 mm.	..	..	8.4 %
,, III :	0.01–0.03 mm.	..	..	44.6 %
,, IV :	0.03–0.07 mm.	..	..	36.2 %
,, V :	>0.07 mm.	..	..	3.2 %

This is a very typical younger loess.

C. Wind-borne Sand, from the coastal dunes of the Baltic Sea, Kuhrische Nehrung, East Prussia.

<0.1 mm.	..	..	..	nothing.
0.2–0.1 mm.	..	..	..	4.1 %
0.5–0.2 mm.	..	..	..	75.0 %
1.0–0.5 mm.	..	..	..	20.3 %
2.0–1.0 mm.	..	..	..	0.3 %
				99.7 %

The grains are well-rounded. The material of the dunes is derived from the sea, though it originally was washed out of morainic and other glacial deposits. A black, somewhat magnetic mineral is frequent in the sand.

This is an interesting analysis in so far as it shows that aeolian sand, too, can have a distinct concentration of grains in a certain grade. It would be interesting to follow up this observation and to study sands of recent desert regions.

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D. Cryoconite, from the surface of Green Bay Glacier, Spitsberg.

		<0.002 mm.	traces.
Grade	I + II :	<0.01 mm.	..	..	7.79 %
„	III :	0.01–0.03 mm.	..	..	18.36 %
„	IV :	0.03–0.07 mm.	..	..	42.00 %
„	V :	>0.07 mm...	..	..	31.85 %
					100.00 %

This is a sample of wind-blown dust as it is frequently found deposited on the surface of recent glaciers. The dust is derived from the surrounding mountains and blown about by the wind until it sticks to the wet surface of the ice. The grading seems to indicate that it is of coarse, loessy nature, distinctly sandier than typical loess, probably because of the neighbourhood of its source of origin. The sample was kindly supplied by Dr. H. Knothe, Breslau, Germany.

E. 'Yellow Earth,' from Bretten, Baden, Germany. Age :
Middle Muschelkalk.

Grade	I :	<0.002 mm.	..	0.0 %	
„	II :	0.002–0.1 mm.		3.1 %	No calcium carbonate.
„	III :	0.01–0.03 mm.	..	80.8 %	Loss due to solution, etc.,
„	IV :	0.03–0.07 mm.	..	12.5 %	2.8 %, not included in
„	V :	>0.07 mm.	..	3.5 %	these figures.
					99.9 %

Unlike the other samples, this material was treated with hydrochloric acid for dispersion. Though comparatively soft and friable, this 'yellow earth' is a fairly solid rock. It is supposed to be the residue of a dolomitic limestone, and belongs to the middle division of the Middle Triassic. It is thus infinitely older than the Pleistocene sediments usually submitted to mechanical analysis, but it shows that, under certain favourable circumstances, the method lends itself to investigations into the origin of earlier deposits also.

The result shows a typical wind-blown dust, very similar to Pleistocene loess, but a little on the finer side. The conclusion, that there were desert-like areas or at least barren districts along the coast of the Muschelkalk sea, agrees well with many other observations concerning the climatic conditions and environment during Triassic times.

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F. Lower Crayford brickearth, recreation ground section, near Erith, Lower Thames (submitted by Mr. A. L. Leach).

Grade	I :	<0.002 mm.	..	13.3 %	
	„	II :	0.002–0.01 mm.	..	10.9 %
	„	III :	0.01–0.03 mm.	..	14.2 %
	„	IV :	0.03–0.07 mm.	..	24.5 %
			0.07–0.1 mm.	..	27.4 %
			0.1–0.2 mm.	..	5.6 %
			0.2–0.5 mm.	..	3.5 %
	„	V :	0.5–1.0 mm.	..	0.3 %
			1.0–2.0 mm.	..	0.3 %
			>2.0 mm.	..	nothing
					100.0%

Loss due to solution etc. : 3.6 %, not included in these figures.

The Lower Crayford brickearth was suspected to be a true wind-borne loess and thus to be of particular palaeoclimatic interest since such sediments are rare in England. Contrary to expectation the analysis does not show the typical loess-grading. It is possible that a certain amount of wind-sorted material is included (maximum between 0.03 and 0.1 mm.), but it is more likely that the material was derived from the Tertiary strata of the neighbourhood (? Thanet sands), perhaps transported partly by wind, and deposited in a pond of standing water. The Lower Crayford brickearth, therefore, cannot be regarded as a reliable indicator of a glacial climate.

G–H–I. Three analyses of samples from the Mousterian Cave, 'La Cotte,' St. Brelade, Jersey. Samples submitted by Dr. R. R. Marett, Oxford.

The results will be published with the Société Jersiaise. The presence of loess and other wind-borne deposits in the cave was established. At present the cave faces the sea directly, and under such conditions transport of wind-blown dust into the cave is impossible. The presence of loess thus indicates a period when the sea-level was lower than at present, and when the climate was drier. It is reasonable to assume that this was the interglacial Riss-Würm.

(2) GRAVEL ANALYSIS

Similar to mechanical analysis, gravel analysis helps to reconstruct climatic changes or fluctuations. Samples of gravels from different terraces of one and the same river area are taken, and passed

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through a set of sieves. Of each grade thus obtained, a certain quantity (usually about 1,000 grains) is sorted into the different varieties of rocks and minerals composing the gravel, and the result is represented either in percentage figures or in a proportion in which the number of quartz grains is reduced to 10. It is important always to compare the same grades of different gravels since the proportions vary considerably with the grades. The obtained figures enable one to find :—

(1) Any alterations in the catchment-area of the river, and at the formation of which terrace the alteration took place.

(2) The date of volcanic events in relation to the sequence of terraces.

(3) The relative age of glaciations which invaded, or touched, the river area. Pebbles of foreign rocks are introduced into the river-area by the action of the ice. They, therefore, suddenly appear in the gravels of the terrace which was formed after the glaciation. In the next younger terrace their percentage will be less, etc., until another glaciation brings fresh material and a new increase ensues in the figures for foreign pebbles. Their number being always comparatively small as compared with the local material, it is necessary to study large quantities of gravel for this purpose. In this way it has already been possible to connect the respective boulder-clays of Germany with certain river-terraces, and thus to establish a reliable relative chronology.

(4) In certain river areas where the gravel is of a more varied nature and does not chiefly consist of quartz or flint, the climatic conditions under which the gravel was deposited, can be determined directly by means of a gravel analysis. It is impossible to render a detailed account of this method here. In principle, it is based on the observation that pebbles are worn down during the fluvial transport in accordance with their mechanical and chemical powers of resistance. The hardest and chemically most resistant component, which, as a rule, is quartz or flint, will thus increase in number downstream, provided there are no disturbances caused by material derived from the local slopes. This, of course, applies to pebbles of one and the same grade only. On the other hand, the law applies also to the different grades of one and the same sample, the smaller grades being richer in quartz. The composition of a gravel, therefore, can be reproduced in form of a curve showing the respective frequencies of the components in the various grades.

The form of this curve is typical of almost every gravel, and

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those of samples from different localities in the same terrace, are very similar to each other.

The form of the curve further depends on the climate during the deposition of the gravel. In an arid climate with prevailing mechanical weathering, it is only the mechanical hardness of the components that determines the speed of destruction of the pebbles. Feldspar and other hard, but chemically little resistant rocks, therefore, are found even in the small grades. They decrease *slowly* in quantity, and the hardest component, viz. quartz, increases *slowly* in the smaller grades.

In a humid climate with chemical weathering, chemical decomposition supports mechanical wear, and most of the components are rapidly destroyed. The quantity of quartz, therefore, increases *rapidly* in the smaller grades, whilst the total of the non-quartz components decreases equally *rapidly*.

When studying systems of river terraces in this way, one arrives at a detailed sequence of climatic events, with the fossil human industries closely correlated to them. In central Europe, this sequence has proved to be the same as that found by studying the loesses. Thus, valuable independent evidence has been afforded for the division of the Pleistocene into a number of climatic phases, and for the correlation of Palaeolithic industries with these phases.

The climatic fluctuations which could be established, based on the work of a great number of authors on loess-sections and river-terraces, have surprisingly been found to agree closely with certain fluctuations of the intensity of solar radiation, calculated on an astronomical basis. This enables one to arrive at probable approximate dates for the Palaeolithic cultures, dates which though obtained independently agree excellently with earlier estimates or calculations. Taking together all the evidence at present available, the following table can be constructed which summarises the present state of our knowledge concerning the probable age in years of some cultural phases. Corrections of this table will almost certainly be necessary in future, chiefly in connexion with improvements of scientific methods, and with the forthcoming of fresh evidence. It is, however, not very likely that really substantial alterations will have to be made. Though this table applies to Germany, France, and England only, field evidence already shows that it might be available for some other parts of Europe also. It is, nevertheless, impossible to foretell how far it applies to more distant regions of the world.

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Probable duration of Palaeolithic cultures :—

Abbevillian (Chellian) : end of Günz to beginning of Mindel glaciation : 550,000–470,000 years before present.

Clactonian : beginning at least with the Mindel glaciation, probably earlier, ending in the first half of the interglacial Riss–Würm : years 450,000–150,000.

Acheulian : end of Mindel glaciation to middle of interglacial Riss–Würm : years 430,000–150,000.

Levalloisian : from the first cold phase of Riss into the interstadial between the phases Würm 1 and Würm 2 : years 230,000–80,000.

Mousterian : appearing after the cool phase Pre-Würm and ending in the interstadial Würm 1–Würm 2 : years 130,000–80,000.

Aurignacian : before, during, and after, the cold phase Würm 2 ; perhaps even later : years 90,000–60,000.

Solutrian : during the maximum of Würm 2 : about 70,000.

Magdalenian : from the decline of the glacial phase Würm 2 to the maximum of the (weaker) phase Würm 3 : 70,000–23,000.

Mesolithic : appears immediately after the maximum of Würm 3 : 23,000–7,500 before present.

One gravel analysis has so far been carried out in the Institute, viz. :—

Schwammelwitz, Middle Silesia, Germany. Cold and arid river gravel of the Glatzer Neisse.

	QUARTZ.	NON-QUARTZ.	RELATION Q: N Q.
10–5 mm.	54.5 gr.	182.8 gr.	10 : 33.6
5–3 mm.	16.8 gr.	33.5 gr.	10 : 19.9
3–2 mm.	9.2 gr.	14.9 gr.	10 : 16.2

This analysis illustrates well the slow decrease of the non-quartz components in an arid gravel. The sorted gravel is shown in the permanent gravel analysis exhibit in the lecture room of the Institute.

(3) *Tree-ring Analysis*

A third exhibit in the lecture room illustrates the method of tree-ring analysis which was originally evolved by A. E. Douglass.

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It works for the last one or two thousand years only, but within this range it has successfully been applied to the prehistoric Indian villages in the south-western United States. Some work has also been done on the Sequoias of California, further in Sweden, and a few trees of other European countries have been studied also.

Annual growth-rings are developed by trees growing in a climate with distinct seasonal changes influencing the conditions of growth. In particular, the winter of the temperate regions produces very marked rings which can be used to determine the age of the tree and, provided the year when the tree was cut is known, also to assign each ring directly to a certain kalendar-year. The width of the rings varies with the age, the inner rings of each individual tree being wider than the outer ones. It further varies with the climate, comparatively narrower rings being produced in years with unfavourable climatic conditions. A curve that reproduced the varying thickness of subsequent rings, therefore, reproduces the fluctuations of the local climate.

Since the climate partly depends on more general factors, periodical fluctuations extending over a period of years are often shown by the growth-rings. Thus, Douglass was able to find, in trees from Arizona, the cycle of the solar spots reproduced by the annual rings of trees. To illustrate this fact for an entirely different region, I was able to obtain, through the courtesy of Messrs. John Wright & Sons, Ltd., E.3, two samples of West African wood which show that in a tropical region, too, the cycle of the sunspots has an influence on the growth of trees. This should encourage one to try and apply tree-ring analysis to regions other than temperate. Messrs. Hilyer & Marchant, Ltd., W.10, were kind enough to mount solidly the two samples in question. My best thanks are due to the two mentioned firms for the support received.

These two West African woods are :—

- (1) *Entandophragma utile*, and
- (2) *Dumoria heckeli*.

Both show, apart from a not very distinct annual periodicity of growth, broader stripes of apparently lighter and darker wood. The stripes are caused by certain structural differences. If the specimen is turned by 180° , they appear in a reversed order. Each pair of a dark and a light stripe must represent some sort of periodicity in the growth of the tree ; and my supposition that this periodicity has something to do with the sunspot cycle, was confirmed when countings were carried out. In *Entandophragma utile*, 11.3 annual

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rings were, in the average, contained in each of the double stripes in question (79 in 7 cycles). In *Dumoria heckeli*, the corresponding figure was 12.0 (60 in 5 cycles). In view of the indistinctness of some of the annual rings, the result has to be considered as fairly satisfactory, the length of the sunspot cycle being 11.4 years.

Such studies show that there are external influences on the growth of trees, influences which, as has been shown, act simultaneously on all the trees of one locality, so that growth-rings of a bad year, for instance, are small in all the trees, etc. These properties of the growth-rings enable one to correlate growth-ring series of different trees of the same district and to count backwards in years, correlating the inner rings of young trees with the outer rings of older ones. The application of the method to archaeology rests in the fact, that, it can be applied not only to trees of a certain wooded area, but also to the timber derived from it and used by man in prehistoric and early historic sites. A pueblo in Arizona, for instance, was dated by Douglass as having been built in A.D. 1075.

FUTURE RESEARCH

In 1938, it is intended to carry on research chiefly on the following lines :—

(1) To prepare for publication an 'Introduction to Geochronology.'

(2) To work out the results of the Italian expedition.

(3) To compile, from various sources, a series of geochronological tables for the use of archaeologists, the first to be on the Neolithic and Bronze Ages, the second on the Mousterian and Upper Palaeolithic.

(4) Incoming samples from prehistoric sites and Pleistocene sections will be investigated, and studies bearing on the composition and origin of British brickearths will be continued. In this connexion, experiments will be made to improve analytical methods.

Current British Archaeology

A SURVEY OF AIMS AND NEEDS

Being the substance of a public lecture given at the Institute on October 29th, 1937

By C. F. C. HAWKES, F.S.A.

THE cardinal fact about British archaeology is its decentralization. Considering the small size of the country and the tiny proportion of our population, time and money which is even now concerned, this is really phenomenal. Our German and Scandinavian colleagues regard it with a wonder which even the friendliest of them can never, I think, really get over, and yet we ourselves are for the most part proud of it, and rightly conscious of its strength. For beside our plethora of county and district archaeological societies, there is no lack of larger units of effort, in the great national societies, headed in dignity by the Society of Antiquaries, and in regional bodies of varied scope but more than local importance, among whom the organization of workers in Wales ranks in its own way as national, whilst others are masters of particular fields, such as the Roman frontier problems of the North, or the Eastern Fenland. And I take it that it is the aim of the centrally-placed brains among us not to dominate but to co-operate with, inspire, and guide the varied enthusiasms of local workers, so that decentralization shall not mean disunion and dispersal of effort, but a unity all the more vital from the multiplicity of its roots. I suppose I am merely voicing the opinion of everyone who has seen something of our common concerns, when I say that this position is fundamentally healthy and sound—according as it so evidently does with the democratic spirit alive among English institutions. But in practice it presents problems of its own, which lay a special responsibility on the brains at the centre, if what might be merely an agreeable federation of easy-going mutual admirers is to be a self-fertilizing seed-bed of scientific work.

The nature of those problems in general is clear enough to need no mouth-filling formula of definition: it is better to turn from the

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abstract to the concrete, and with the uneven mosaic of our peculiar state of semi-organization as the all-important background, to see what our aims and needs make of them in actual practice. Now these aims and needs of our archaeology to-day, some of which I shall in this lecture try to formulate, are I fancy best approached by way of a glance over the activities of the last dozen years, from which we shall see something of what has been done, and so of what remains to do. The mechanism of those activities has been the vital poise, the unstable because living equilibrium, between central or national and local or regional exertions of which I have already spoken. And I think it has worked extremely well. But of itself that mechanism has to a large extent conditioned the character of the activities—in other words, we have had to cut our coat according to our cloth. To see what this has meant, one cannot do better than turn to the official fulcrum, so to speak, at which our national and regional forces find, or are supposed to find, their point of balance. That fulcrum is the Congress of Archaeological Societies in union with the Society of Antiquaries, with its Council and its Research Committee. In addition to the contacts afforded year by year by the Congress itself, the Research Committee is responsible for a very valuable calendar of work. Its annual Report is designed as a compendium, easily accessible to all, of the year's work in all fields of our archaeology, and under the editorship of Mr. O'Neil I believe it is becoming more valuable than ever as a current record of our doings. But it is more than a record: it includes in most years a Report by an expert or experts, summarizing existing knowledge and laying down lines for further progress in a particular field. And you will remember that this series was inaugurated, in 1930, by a short General Report, the work of the whole Research Committee itself with Sir Charles Peers as chairman, covering every archaeological field period by period, and taking stock of the whole position in regard to the 'Co-ordination of Research.'

What, then, was the position which in 1930 was thus revealed? The Committee found it best to pass over the Palaeolithic except for recommending the excavation of more caves, and the Mesolithic was not yet within its scope; it really started with the Neolithic, outlining what we now call the Neolithic A and B cultures and calling for more work to explain their inter-relation. Recognizing that causewayed camps belong to the A culture, it urged the excavation of more habitation-sites of all kinds, and in the meantime deprecated except in special cases operations on long barrows or megalithic

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structures generally. For the Bronze Age, the Committee felt that we knew enough for the moment about barrows and cemeteries, and again demanded the discovery and excavation of habitation-sites. Of those known, it mentioned Park Brow in Sussex for an open village, and for earthworks the square South Lodge type in Cranborne Chase, but until more was known it would not commit itself even to the already long-current attribution of the latter to the culture of the Late Bronze Age 'Deverel-Rimbury' urnfields. This piece of scepticism well illustrates the tenor of its whole message up to this point: it wanted the archaeology of the dead, in their tombs and cemeteries, supplemented by that of the living in their dwellings. With the Iron Age it found the position in part reversed: apart from the urnfields of the South-eastern Belgae, too little was known of burials, whereas of habitations, especially hill-forts, enough had been done to encourage further work on regional lines, especially in the hinterland of the south and east coasts, and in the south-western counties generally; in Wales and the Marches, and in the North, on the other hand, the need was to find out if there was a pre-Roman Iron Age culture at all. It further recommended more study of the transition from Iron Age to Roman civilization, on the one hand by work on native sites with Roman successors, and on the other by getting at some early Roman military sites in the South or the Midlands. The rest of the military archaeology of Roman Britain it found was well provided for, and it was fairly confident of the position in regard to towns; what it urged with the greatest emphasis was the detailed study of Roman villas, their history and economics, and in a less degree also of peasant villages.

For the Pagan Saxon period it suggested that graves were 'so well-known in most districts that further work in this sphere is to be deprecated,' but villages were in especial need of attention both for Pagan and Christian times. Finally, work on Late Saxon and Medieval sites was called for to provide a dated series of pottery, in particular on Danish camps, Burhs of the Saxon Reconquest such as Witham, domestic sites of the period of Domesday, and motte and bailey castles, especially adulterine castles of the mid-12th century. Later medieval sites, except in particular cases, should be left alone.

Now the general tone of this Report is one of reasoned optimism. 'We already know a good deal' it seems to say, 'but there are certain obvious gaps which we must set out to fill. It needs energy and it needs care, but it can be done. Let us, therefore, set to work.' And on some at any rate of these gaps, we have set to work, and a

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great deal of new knowledge has been won. But the result has been, as was indeed inevitable, to upset much of what we thought we knew before, and also to reveal other gaps side by side with the ones already indicated. And some even of those are still as yawningly empty as ever they were. In short, we are rapidly moving towards the moment when the whole position must be formulated afresh, and my first plea this afternoon is that in 1940 the decade from the publication of what I may call the Peers Report may be marked by a fresh one, produced by the same Research Committee, in which this re-formulation will be carried out. The work of the 1940's will thus receive a directive impulse like that which the Peers Report has been giving us in the 1930's. I very much hope that this will be done, and indeed done every decade for the rest of the 20th century, though what manner of Report should be issued to mark the year 2000 I would rather not venture to predict. The 1940 Report will be quite difficult enough to frame, and I think it is not too soon to start meditating it already. A lecture like this may serve provisionally in the manner of what I believe is called a light engine, which is sent, in a mingled spirit of duty and adventure, down the line ahead of a royal train.

First of all, then, what about the Palaeolithic? Let us be quite frank, and admit that many of us think the Palaeolithic is a bore. Pleistocene geology on the one hand, and what is facetiously called flintology on the other, tend to repel the uninitiated, especially people educated in human rather than natural-scientific studies, who recoil from them as inhuman. And when one does get a closer acquaintance with the literature one finds what at first sight seems a welter of conflicting opinions among the specialists, which may set up a positively contemptuous attitude of scepticism. Yet, in the first place, we all know how deeply discoveries of the antiquity of man have affected the whole course of modern thought about Man and the Universe: once Palaeolithic studies are lifted from the particular to the general, we implicitly recognize their importance in our whole outlook on the progress of humanity. And in the second place, work on the Palaeolithic is ideally suitable for the exercise of co-operation between the expert, in his national or academic institution, and the amateur enthusiast in the country. Hundreds of our fellow-citizens, often of the humblest kind, find flint-collecting an absorbing hobby, and it is a well-known fact that we owe many of our most important Palaeolithic discoveries to the devotion of amateurs. First of all, then, co-operation with local or individual

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workers should be maintained and our flint-collecting friends assisted along the paths of progress which specialist research has in the past few years been making. And secondly, I think, specialist research should itself display more of a concerted plan of campaign. The Pre-Crag and the Cromer industries have been and are receiving generous attention in the famous East Anglian hunting-grounds of Mr. Reid Moir. The Clactonian industry is being admirably brought into the limelight not only at Clacton itself but on the Lower Thames, and from the Lower Gravel where it abounds onwards through the beds of the 100-foot Thames Terrace, and on to the ensuing phases of the 50-foot Terrace, recent research has done and is doing much to clarify the all-important relationships between the Clacton and the Levallois flake-cultures and the Acheulean hand-axe culture in its heyday. So far so good. But the genesis of the Clactonian is still tantalizingly obscure, and the Chellean, which claims in our textbooks paternity to the Acheulean, has in recent years become the shyest fowl in the whole flock. One has an uneasy feeling that no one really knows the difference between it and Acheulean I : that even when called on by its modern magic name Abbevillian it does not respond with much alacrity, and that when one is summoned to state in what deposits it really occurs, the answer, though retaining much cortex and flaked in a violent zigzag manner on a stone anvil, is none the less embarrassingly like a lemon.

To turn to the other end of the hand-axe period, we all have a lot to say nowadays about the interaction between developed hand-axe and flake cultures, about wood-bar technique and resolved flaking, and about the hydra-headed—or if you prefer, Protean—character of what used to be so conveniently called the Mousterian. How does all this illuminating lore really fit the geological sequence of our Middle Pleistocene deposits? It is true that we know a great deal more than we did about the 50-ft. terrace of the Thames, and that Professor King and Mr. Oakley have improved everyone's digestion by their brilliantly-conceived promotion of the frigid peat of Ponder's End to the dignity of a sweet, or at least a savoury, instead of, as it once was, a mere junior cheese in the Pleistocene menu. But there is a great deal else that needs overhauling. Take East Anglia. Nearly 150 years ago, John Frere pointed out the rich deposits of Hoxne as a potential reservoir of knowledge concerning the Antiquity of Man. Much excavation has been done there since. The interglacial lake-beds of that great site have been explored by Mr. Reid Moir, for example, and shown to contain Palaeolithic

remains of an importance which fully bears out Frere's prophetic instinct. Yet when the latest recruit among the students of our Pleistocene, Dr. Zeuner, has to sum up the position in regard to this key sequence of deposits, he is compelled to confront us with the fact that we have not yet been able to reach general agreement on the identity of its limiting glacial deposits. What should be a major contribution to the piecing together of the human record remains a matter for doubt. I look forward, as keenly as the East Anglian workers themselves, to the day when the true correlation of their glacial and interglacial series will be demonstrated beyond cavil.

Then again, in the twenty years before the War, that doughty veteran, Mr. Worthington Smith, valiantly explored the Pleistocene deposits of the Chiltern Hills. At Gaddesden Row, Round Green, Caddington, and Luton, he brought to light a magnificent series of human industries *in situ*, demonstrated their submergence beneath a glacial trail of 'Contorted Drift,' and did his best to correlate the whole with what was then known of the sequence on the Thames. How does the tale he tried to tell fit in with what is being told us to-day? His finds lie for all to see at the British Museum, and have received the weightiest publicity in Mr. Reginald Smith's *Stone Age Guide*. Yet though at least two of our younger workers have given assurance that they intend to take the matter up, nothing has yet been done.

To take a final and culminating case, what have we to show for a record of the transition from Middle to Upper Palaeolithic and on to the earlier manifestations of the Mesolithic? The lower horizon of this important sequence could in former days be cosily tied down as the Mousterian, and every effort has been made, from the classic expositions of Miss Garrod to the finely calculated indiscretions of Mr. Burchell, to provide us with a reliable safe-conduct through the frontier marches between the bleak world of Neanderthal Man and the Boreal and Atlantic periods which are contemporary with the Dawn of Civilization in the Near East. The orthodox will reply that the textbook sequence is enough to be content with: with the morrow of the first Würm glaciation, the varied manifestations of the Mousterian disappear, presumably with the extinction of Neanderthal Man, and their place is taken by a well-defined Aurignacian, which with a slight Solutrean and a very moderate Magdalenian intervention, holds the stage till its descendents pass straight into the Mesolithic. But which exactly are the deposits of the Würm I glaciation? And of the Würm II, and of the Würm III? And how do they fit in with the more or less classical industries of our caves?

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Is it at all fair to make the magic word Creswellian do duty for virtually everything between the Aurignacian and the earliest fixed point of the Mesolithic, the Boreal Peat of Broxbourne about 6000 B.C. ? I have an uneasy feeling that we are letting the respectability of our accepted text-book industries lull us into a false sense of security. It is good to be able to point with pride to the Font-Robert level at Creswell Crags, but what is the age of La Font-Robert in terms of the glacial retreat of Northern Europe ?

We all know to-day that Geochronology and Pollen-analysis have furnished an absolute time-table for Northern Europe which can be taken back step by step to the Late Magdalenian Hamburg culture of Meiendorf, which it provides with a reasonably fixed horizon about 20,000 B.C. At that point a sort of junction is made with the lower end of the accepted Palaeolithic sequence, the validity of which is entirely independent, and that is reckoned to stretch still further back, accommodated as well as ingenuity will permit to a glacial sequence dated in the astronomical figures of the chronology of solar radiation. The outline so obtained for our archaeology is most impressive and magnificent. The inspiring presence among us of Dr. Zeuner has clothed it with illumination, and one is tempted to feel that it has only to be filled neatly up with archaeological pieces whose independent value is already known, and guaranteed by the names such as Magdalenian, Font-Robert, Aurignacian, etc., which have been given them. But how little of independent value there really is ! How utterly flimsy is our archaeological calendar for these crucial thousands and thousands of years ! I feel a very real horror and dismay when I come across a geologist dating a deposit by reference to an archaeologist's opinion on the flint implements it contains. I am sure it is a topsy-turvy proceeding. It is the botanist and the palaeontologist who are his natural referees—and I submit that we archaeologists ought to get our own house into far better order in these connexions before offering pronouncements on this and that.

But if we will come into the game humbly and honestly, I believe we may have a really glorious opportunity to help set on foot a genuine advance of knowledge that will be of benefit to everyone. How often does the intelligent layman enquire 'how long ago it all was' ? Why need we go on fluttering between the alternatives of shuffling out of giving a straight answer and giving one we do not wholeheartedly believe ? This matter of chronology is not of mere academic interest—its settlement is absolutely essential if the findings

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of our science are to win the place they ought in the general framework of modern knowledge. And it can only be settled if our geologist colleagues and their associates succeed in drawing up a firm table of post-glacial and late-glacial time, which will provide our human industries with a clear setting in physical geography. It may be said that much is already in various ways being done. Mr. Reid Moir is still working indefatigably away in East Anglia, and on the Lower Thames, and in directly comparable regions such as Lincolnshire and North Norfolk, Mr. Burchell has gathered results which may shock the susceptibilities of some, but which certainly give us no excuse for sitting by with hands folded. Some of us heard a new instalment of such results last night, and it is perfectly clear that the text-book prehistorian has a great deal still to digest. But there is only one way to get these formidable gobbets into their right place in the meal, and that is team-work in the kitchen. The danger here is not too many cooks, but too few. What we shall need in the not far distant future is a Quaternary Research Committee for Great Britain, with a picked membership and a long-term programme of field and laboratory work. What such a Committee is achieving in Ireland was revealed to us two days since, in the course of a weighty discourse in another place by Dr. Adolf Mahr. What similar bodies of workers have done and are doing in Scandinavia and North Germany is already classic. We must not be left behind. The problem of correlations and chronology in the Palaeolithic will always remain contentious unless we can build a continuous bridge back from the known horizons of Atlantic and Boreal times to the ages of Quaternary glaciation. I cannot believe this is impossible. The brilliant work of Dr. Godwin and his colleagues at Cambridge on the natural history of human settlement from the Boreal forwards into historic times must be carried backwards, to join up with the geological record of man in the Pleistocene. From the peats of the London basin to the Carse clays of Scotland, there is an enormous field of almost uncharted work. Has anyone ever attempted to marshal our post-glacial and late-glacial sedimentary deposits in an orderly sequence agreeable to geochronology? Can we say it is impracticable until we have tried? And let no one dismiss such a programme as a job for Natural Science, needing no attention from the students of mankind. It is not merely prehistoric landscapes, but their human occupants, that await identification. And those human occupants must include the ancestors, both physical and cultural, of the peoples on whom in the third millennium there began

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to break the Dawn of European Civilization. Until this work is done, the prehistory of civilization in this island remains a torso, with the grinning skull of Palaeolithic man floating unattached above its shoulders.

This then is my first concrete proposal. Our prime need is to connect the body of our prehistory with its head, and our first aim should be to move towards the formation of a National Quaternary Research Committee to do the job. Obviously, natural scientists will play a major part in its activities. But if archaeologists can make an initial contribution to its equipment, I suggest it could very well take the form of an illustrated Corpus of all the leading groups of Palaeolithic and Mesolithic implements found *in situ* under test conditions in geologically significant deposits. Where such groups have been published recently and in an up-to-date manner in an accessible place, they would not always need inclusion, but for how much material one now has to hunt about hither and thither—if indeed it has been published at all—which, if brought in an orderly manner within a single pair of covers, would show us what we are really talking about! It is easy enough for us moderns to laugh at De Mortillet and his watertight compartments, but his Musée Pré-historique had at least the merit of frankly putting his cards on the table, and if we were to take a little trouble, we could do the same thing with ours to-day. It would at any rate give the Quaternary Research Committee a sensible archaeological start.

For our 1940 proposals, then, we already have much to set against the Peers Report's reserve on Pre-Neolithic matters. What, then, about the Neolithic itself? Knowledge of the inter-relation between Neolithic A and B has made great strides, and in Mr. Stuart Piggott alone the Peers Report's appeal has here borne wonderful fruit. The Fenland Research Committee's discovery of a Neolithic A layer, sealed below late Atlantic blue clay at Peacock's Farm, shows us how Neolithic research can join hands with the Quaternary programme I have just outlined, and Mr. Burchell's and Mr. Reid Moir's recent discoveries of mysterious primitive potsherds in surprising geological positions are a further finger-post in this same direction. The main influx of Neolithic A culture came in, as we know, from the continent of Western Europe, and in France and Switzerland it is easy to recognize its affinities. Its division into two stages, corresponding roughly to the Cortaillod and Michelsberg cultures which succeed one another in the Swiss Lake area, is a former notion of Mr. Piggott's which seems inadequate to explain

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the facts by itself, but recent discoveries at Hembury and Maiden Castle have shown up the distinctive character of the south-western group of the culture, which seems to have a unity of its own within the whole. It may well be that it was this group which was responsible for introducing the long barrow into the Neolithic A complex, for all that this year's work at Maiden Castle has shown the longest of all long barrows to be secondary and posterior to a typically south-western Neolithic camp or town. For we must not forget that while these causewayed camps have their continental affinities not so much in the West as in the West-Centre of Europe, in the Michelsberg culture which I mentioned just now (as the camps of Mayen and Urmitz show us in the Rhineland), yet the Michelsberg culture has no long barrows. And so I suggest that our aim here should be not to deprecate more work on long barrows and megalithic tombs in favour of camps and habitations, but concentrate on the relationship between them and the camps. Is the sequence just revealed at Maiden Castle typical, or like the long barrow there itself, exceptional? To answer this question, our need is surely to excavate more long barrows in regions where camps are known, and conversely to try and find camps or habitations in regions where only long barrows are known. For the former, Hambledon Hill in Dorset, where a camp and long barrow lie side by side, has a clear claim to attention, and one might add the long barrows of West Sussex, closely adjacent as they are to the well-known camp of the Trundle. For the latter, Mrs. Clifford's work on the Cotswold long barrows would gain enormously in value if she could also bring to light the habitations of their makers, and it would be no less valuable to locate the dwellings of long barrow folk elsewhere outside the known distribution-area of the camps, *e.g.* on the Lincolnshire and Yorkshire Wolds. Here is a plain cue for co-operation between local explorers and central resources.

With regard to the inter-relation between Neolithic A and B, it is now clear that while later Neolithic A pottery, as at Abingdon and more strikingly at Whitehawk near Brighton, may show decorative influence originating with Neolithic B, Neolithic B itself is by no means exclusively late, but may be as ancient as A, though for the most part keeping itself to itself in the East of England. There is a further excellent reason for this which I have not heard very precisely formulated. We all know, especially since Professor Childe's paper of 1932, that Neolithic B has its affinities eastwards, in the Baltic. The Dwelling-Place culture of Sweden is manifestly its

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cousin, as its similarity in pottery makes especially clear, and it is evidently a far-flung member of a great family of Neolithic cultures in North and East Europe. But that similarity is not identity. Last year's Oslo Congress afforded some of us the opportunity of searching the museums of the Northern cities for exact parallels to our Neolithic B types, and the result we have all confessed was that there simply are not any. The relationship is not one of exact identity, but of a vague general family feeling. For before the full development of the Dwelling-Place culture of the Baltic, and before our Neolithic B had at all completely run its course, the vital intermediate region of Denmark was invaded by the sea-borne current of Western civilization which introduced there the megalithic dolmens, and on this followed profound modifications in the form and ornament of pottery of which our Neolithic B material shows absolutely no trace. The culture was, therefore, established here before the megalithic series opens in Denmark. And this is as it should be, for the convention of impressed ornament, in particular of cord-impressed ornament, in which the family feeling I have spoken of is most evidently expressed, is already to be seen on pre-dolmen pottery from the end of the Danish Mesolithic. In Britain too, therefore, Neolithic B and its distinctive pottery should find its starting-point in the Mesolithic: the family feeling has its roots in that Mesolithic continuum which Dr. Grahame Clark has so powerfully illuminated as binding together Eastern Britain with the whole North European culture-area stretching as far east as the confines of Esthonia and beyond. How far back in the story of that Mesolithic continuum do the roots of our Neolithic B then go? That is one more question which our Quaternary Research Committee may answer. Pottery of a kind in Denmark goes back to the dawn of Atlantic times about 5000 B.C., and discoveries like those of Mr. Reid Moir and Mr. Burchell, when fitted into their proper place in a full scheme of Mesolithic prehistory, may well turn out valuable links in relating to origins of a like antiquity a culture which, as we all know, takes us right down into the beginnings of our familiar British Bronze Age. I call, then, for more work on Neolithic B—its habitations, the material of its culture, and its origins in the still misty Mesolithic past. Neolithic B is principally to be found along the rivers of South-eastern England, and it ought to be possible to locate and define its position in relation to the estuarine deposits, and the depression of the land which during Mesolithic times finally sundered Britain from the Continent. It occurs, for example,

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though rarely, on the well-known sunken land-surface of the Essex coast, so long explored by Mr. Hazzledine Warren, as does Neolithic A also, and more notably still, of course, the finger-ornamented and grooved wares which are now being hailed as a fresh element appearing within the same period as the earliest of our British Beakers. The emergence of this ware into the rich baroque style of the Woodhenge pottery has recently been ably traced, and when A Beakers follow B, they are found to be associated on domestic sites with the finger-printed ware in the special forms in which it has been recently recognized *e.g.* at Holdenhurst in Hampshire and at the Arminghall monument near Norwich.

Now we are making every year substantial progress in the elucidation of these momentous centuries around and after 2000 B.C. And a substantial part of that progress has come through our following the injunctions of the Peers Report and excavating where we can in habitation-sites. It has been shown, in the Fens and on the Essex coast, especially useful to do this where there is a natural stratification, enabling one to relate the occupation to its horizon in the natural history of its region. But such sites are obviously not to be found everywhere, and I feel that discoveries since 1930 have made the need for more Bronze Age dwelling-site excavations more pressing than ever. At the same time, it is clear that ritual and sepulchral structures have a great amount to tell us, not only about themselves, but about the culture of the people that made them. In the search for origins and affinities, ritual and its material embodiments may be as potent a pointer as the domestic furnishings of a hovel or a midden. We want both kinds of evidence. Take round barrows first of all. The Peers Report came at a moment when no more work on them was for the time being required. In a sense this is still true: we do not want to excavate barrows simply for the sake of excavating barrows, like our Victorian forebears. But first of all, air-photography has flown into our midst with a large crop of barrows that no one previously knew existed, I mean ploughed-down barrows on low ground. All over the south, east and centre of England this is coming to light, and I submit that we now want test-excavations on sample barrows of this kind, so that, when we generalize about round barrows in the future we shall be sure of knowing what we are talking about. Mr. Leeds's recent work in the Oxford district well shows the sort of thing I mean—it is not very sensational, perhaps, but it is useful and eminently suitable for local workers of careful habits but small resources. Secondly, the

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modern technique of excavation, which has squeezed out of long barrows and megaliths so much knowledge of their structure and its ritual implications, can do the same for a perfect round barrow here and there with most useful results. Sir Cyril Fox has been doing such a text-excavation in Wales this summer, and in regard to the south of England a little more knowledge of this kind might be useful in a wider context.

It is in these days persistently rumoured that within the complex of our British B Beaker there are two strands to be distinguished—making with the A Beaker culture three elements in our Beaker world as a whole instead of only two, A and B. The first will be the classic B-Beaker Invasion from the Rhineland, the second an immigration of Bell-Beaker folk direct into the south-west of England across the Channel from Brittany. This interesting notion has at present all the attractiveness of the not yet wholly respectable, and in any case it has probably come to stay. Personally, I doubt whether there are many B Beakers in Britain which could not perfectly well be derived, as far as appearances go, from Holland or the Rhineland. One may easily forget how very Western some of the Rhineland Beakers are. But it is quite true that others of them are distinctive, and that these distinctive Rhenish forms are never found among the Beakers of South-Western Britain. And we have to face the further fact that Beaker people are now known to have been responsible for the monumental ritual architecture in stone and timber which has given us Avebury and its Avenue and the 'Henge' monuments in general, and the affinities of that architecture are Western rather than Central European. This seems a strong point for a western strain of immigrants among them. Yet whereas stone avenues and monuments are in Brittany generally speaking associated with collective megalithic tombs, our Beaker people practised single-grave burial in their round barrows in a way which is Central European rather than Western. When considered in this context, then, barrow excavation cannot be said to have wholly exhausted its usefulness in the solution of our Early Bronze Age problems.

Further barrow finds may well also be required for the elucidating of the transition from Beaker to Middle Bronze Age times. The parentage of both the food-vessel and the cinerary urn is undergoing critical revision by certain workers at the present time, and papers by Miss Kitson Clark and Mr. Piggott will shortly, I understand, be published which will pose the problem much more

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fully than was possible in the days when Mr. Reginald Smith's pioneer work put the subject for the first time on the map. I am not going into it all now, but I would only remind you that we know less about the origins of our Middle Bronze Age than those of any other phase of prehistoric Britain, and I think that more material both from barrows and settlements will be wanted to fill the gap. I spoke just now about the discovery of hundreds of new barrows by air-photography, and I might now add that many of these are in parts of the country where there is very little in the way of properly excavated barrow material. Here then are lacunae waiting to be filled up—and not till this is done shall we be entitled to say we know enough to get on with. Air-photography, in fact, has given us a wonderful chance to make the British Bronze Age a really living part of our prehistoric past, and not just a long period in which Providence guided pottery with her left hand and bronze implements with her right hand through a predestined career of typological evolution, neither hand knowing nor caring what the other was doing.

With regard to bronze implements, I am not going to say much this afternoon. But there is still a field, I believe, well suited to part-time students or post-graduate workers living in London, for comparative study of types and associations. The Card-Catalogue of Bronze Implements housed in our Department at the British Museum is always kept up to date, and I think it could be used a good deal more widely than it is at present. For by the Middle and the Early part of the Late Bronze Age our native bronze industry dominated the whole of North-Western Europe, and in this sort of research there is ample opportunity to get the isolation of our Bronze Age studies healthily breached by lines of work on continental affinities. When we get to the real heart of the Late Bronze Age, a century or two after 1000 B.C., particularly fascinating problems are presented by the interaction between this old-established Bronze industry of the West and the new forces moving out from Central Europe, which so radically transformed the course of our prehistory. Good fortune has recently given us several Late Bronze Age habitation-sites, and in some of them pieces of bronze implements have been found which help to connect the study of implement types with that of pottery and material culture at large.

I have suggested a twofold division of the Late Bronze Age, and I believe that it will soon be possible to recognize two regional cultures within anyhow the second, one Eastern, derived from the

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Low Countries, the other Southern, derived from Northern France. Dr. Stone has had something to say on these lines in a recent paper : his excavations in dwelling-enclosures of this period are especially valuable, and so here too I echo the Peers Report's demand for the excavation of more habitations. We cannot afford to neglect any opportunity of getting more knowledge about the Late Bronze Age. It is the crucial period of our Prehistory. The map which I put out some years ago to illustrate one aspect of its revolutionary character—the invasion from the Low Countries—is out of date now. A great many of what passed for prototypes there are now otherwise regarded, and a new map is wanted on the lines I have just indicated, but I may here add that I am glad to find that in recent studies of this finger-printed and other ' Urnfield ' and barrow pottery of the Low Countries, Dr. Bursch of Leiden and I and others here have been coming independently to the same conclusion. That is, briefly, that the expanding Urnfield folk of Central Europe were no more than a potent leaven in bringing about our Late Bronze Age immigrations—the main lump on which they acted being the native populations of the North-Western areas of the Continent whose finger-printed pottery, known to us as the ware of Deverel-Rimbury urns, had been gradually evolving on its own since Neolithic times. Late Bronze Age sites, then, need exploration as urgently as their predecessors—and especially so in virtue of their connexion with the Celtic field-system which now begins to come into the picture.

In the North, the position is rather different, and far less is yet known. But the flat-rimmed pottery of Scotland, which is supposed to mark some sort of Late Bronze Age or Early Iron Age immigration in harmony with ours in England, is in fact well represented in Yorkshire, from burials in barrows both primary and secondary on the wolds and moors, and a sketch-map of them suggests that East Yorkshire has yet a great deal to reveal about the culminating Bronze Age culture of Highland Britain and its penetration from the Lowland or abroad. It is good news that a Prehistoric Antiquities Committee has now been formed in the bosom of the Yorkshire Archaeological Society.

Turning now to the Iron Age of the South, it is at once apparent that in many ways we know a good deal more about it. Sites are very numerous, pottery relatively well known. But we should, I am sure, beware of treating our Iron Age A as too much of a single unity. When I first started work on this period the tendency was all the other way—everyone emphasized the purely local character

of its regional groups, and I am afraid that we may now be tending to unify our picture of it too much. The very brilliance and cogency of Dr. Wheeler's studies in the Iron Age of Wessex may lead some to disregard his warnings and fancy that the A1-A2 sequence, in the form he has proclaimed it, is of universal application. It is not, and I would suggest that the most useful Iron Age programme for us is work on regional lines by local and county societies, especially in counties where the period is relatively little known. In this way less-favoured regions will be able to hold their own against the Dragon of Wessex. The Eastern counties are an example, and it is good news that our Cambridge friends have been turning their eyes afresh in this direction. The Belgic civilization of the south-eastern counties has commanded so much attention in recent years that the humbler achievements of the Earlier Iron Age have not had enough. Yet there is a strong pre-Belgic native strain in the coarse pottery of many Belgic sites, and a continuity in some respects between the subjects of Tasciovanus and Cunobelin and native forefathers of half a millennium before is parabolically suggested by the great bronze cauldron we found in 1932 at Colchester, whose ring handles are cast on in exactly the ancient manner of the Late Bronze Age cauldron-makers studied not long before by Mr. Leeds.

Of the Iron Age in the West, I do not want to say much. The subdivision of the Western Iron Age B proposed by Dr. Wheeler is so obviously the first step in a progress which will lead us to a clear understanding of the whole matter before very long, that it would be waste of words for me to preach about it. No doubt we shall soon be witnessing flying columns moving from hill-fort to hill-fort, reducing them to terms with all the military efficiency of Vespasian in the same field. It is a great programme, and it will give enormous vitality to each year's field-work for a long time to come. But I do think there is one thing which should be said—or rather repeated: as a sequel to Maiden Castle, a scheme should be devised for the excavation, bit by bit, of the *whole* of the inhabited area of a Wessex hill-fort. Unless this is done, the account of Maiden Castle which Dr. Wheeler has given us will remain a magnificently vital creature of enduring bone and sinew, but it will not be clothed with enough human flesh. There is a whole range of burning questions which otherwise will remain obscure—questions which could not have arisen at all without the achievements of the last few years, but which the very magnificence of those achievements makes one thirst to have answered. The density of population, its ebb and flow

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at different periods—was there any zoning or planning of the dwellings?—any difference between rich and poor?—were there definite industrial quarters?—all these things crowd into the mind; and two questions above all—did such an acropolis contain a centre of religious worship—a temple or *temenos*? And did the chieftains whose word raised those often mighty defences live within in any sort of kingly state? Here if anywhere should be knowledge to be won of the life and culture of the Heroic Age of Ancient Britain.

I realize how long-drawn-out and even tedious a process this may be. I know from the experience of Colchester how long one has to wait for results in such a patient process of piecing together inductive and statistical evidence. But I am sure it is worth while when one is dealing with a capital site, and a hill-fort has the advantage over Colchester of being a compact unit visibly bounded by its defences. The Belgic capitals were less concentrated; yet on them, too, long-term excavation can bring otherwise unattainable rewards. In fact, I feel that unless sooner or later we do more of it, our studies of the Belgic culture will remain imperfect. At Colchester the exploration of the Inner Town, where concentration went furthest, has been proceeding since 1930 under the necessity of forestalling the modern builder, and the results have illuminated not only the material culture of its hey-day under the rule of Cunobeline, but also the early history of the Roman conquest and occupation, of which this was, of course, a focal point. But Camulodunum comprised far more than this Inner nucleus; it is well known that many miles of great cross-country Dykes defend the Colchester area on the west, and selective excavation here and there on these has already made a firm beginning of identifying them as defences of the Belgic capital. The framework of such a programme must naturally be a thorough field and air survey, and from this it has become further apparent that the Dyke system as a whole is made up of elements of more than one date. Its history cannot yet be unfolded in detail, but it is already clear (as, indeed, was years ago suggested), that the straight linear earthworks which form the greater part of it are later than at least one dyke planned to follow the contour of the ground. And within the protecting curve of this 'Contour Dyke' lies a Romano-Celtic temple-temenos which trial digging in 1936 proved to be the direct successor of a pre-Roman enclosure with the same plan. If, as seems certain, the bulk of the straight-dyke system must be assigned to the culmination of Belgic power under Cunobeline in the first forty years A.D.,

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this suggestion of an earlier Camulodunum should take the story back into the more mysterious years of the 1st century B.C. Had the native Trinovantes already a capital here when Caesar sought to protect them against the aggression of Cunobeline's forerunner Cassivellaunus? Or thereafter when Tasciovanus established his rule at Verulam, was this the seat of his contemporary Dubnovellaunus? The stages of the evolution of the premier Belgic city of Britain here await solution by the spade. At present too much remains uncertain, and that not only in the narrative of dynastic succession; the blank which archaeology has drawn hitherto in regard to British religion in this, the age of the Druids, stands here to be redeemed, and among the remains of material culture, there may be light on the vexed question of the chronology of British decorative art.

Another step which could be taken is a fuller reconnaissance of the Belgic sites which lie between Colchester and Verulamium. Mr. Ward-Perkins' recent discoveries at Welwyn will soon be everyone's news, and one may hope that the main settlement of which his site must be an outlier may one day engage attention; meanwhile, the next link in the chain has already shown itself at Braughing near the borders of Hertfordshire and Essex, where Arretine and Belgic pottery in abundance, and coins both of Cunobeline and Tasciovanus, have in the last two years begun to promise a rich harvest to any qualified excavator. And to turn for a final moment to Verulamium itself, ought we to let our admiration for Dr. Wheeler's achievements at the Belgic and First Roman 'cities' there blind us to the plain fact—well known to Dr. Wheeler himself—that much more still remains to do? May not the situation he has there created be, in part at least, summed up in the words *potest videri ostendisse posteris, non tradidisse*? For the Prae Wood earthwork does not by itself make a city, and until the area on the slopes below it is explored, we cannot envisage the full extent or chronology of the pre-Roman occupation. If the Verulamium Report is to do the work which it should do in the moulding of our archaeology in the near future, it should be regarded as a stimulus to further exertions, not as their quietus.

The Verulamium sequence brings me to Roman Britain, and of the Peers Report's two initial recommendations here, the new work to which I look forward should do much to amplify our response to the first—that concerning the transition from native to Roman civilization. But neither Verulamium nor Colchester has yet helped

us to meet the second by revealing encampments of the invading army. The search for them at Colchester is being prosecuted in the right quarter, but it is still a search. A fine camp has been photographed from the air near Castor, but has not even yet been published, and from the base-depôt of Richborough to the Fosse Way, nothing of the kind has been submitted to modern excavation. The Fosse line itself has been illuminated for us at Margidunum, and beyond it the Metchley camps at Birmingham have been welcome additions to our knowledge, but the old blanks still remain. Dr. Wheeler's new discovery that the superseding of Maiden Castle by Roman Dorchester was delayed after the conquest for over twenty years turns a new searchlight on to the famous site of Hod Hill, where the Roman police-fort no less than the great native camp containing it should still have important secrets to reveal: there is another such fort at Ashley, near Winchester, and further west, Miss Liddell's last phase at Hembury and the earliest finds from Roman Exeter between them point enquiringly to the Fosse frontier's terminus near Seaton. Similarly, the old conundrum of the Second Legion and Gloucester has yet only been partially answered, and Lysons' early finds at Kingsholm should soon demand revaluation. Here lies the way to supplying the missing first chapters of the Roman military archaeology of South Wales; the analogous site further north is, of course, Wroxeter, and in thus approaching the subject of Roman towns and their antecedents I am deliberately stressing the military side, because the fashionable trend to purely economic interpretation of our *Siedlungsgeschichte* may without it—and under the spell of such generalizations as 'valley-ward creep'—too easily lose touch with historic realities. In the North, where urban civilization came so much farther behind the armies, the position is rather different, but the story of the Roman *limes* and its camps, forts, and roads still lacks most of its counterpart in the record of native sites, and in the hill-fort of Almondbury near Huddersfield, and the huge earthworks of Stanwick in Richmondshire, the Yorkshire Roman and Prehistoric Antiquities Committees have two of the greatest prizes of all potentially within their grasp.

Roman towns, with the Verulamium results before us and Miss Kenyon at work both at Leicester and at Wroxeter, happily cannot be called neglected. Roman London is still producing important new points of detail, and at the other end of the civilian territory there has been much progress to report at Aldborough. There is one name which I should yet like to add to this part of the agenda,

and that is Silchester. Someone really must one day go back there, re-examine the defences and their evidence of date, and explore the areas outside them bounded by the pre-Roman earthworks of Belgic Calleva. The transformation from native to Roman town was here, it seems, carried out without change of site, and the why and the how surely call for answering, above all here where we already know so much. I know that the time may not be ripe for such a suggestion, but it ought not to be allowed on that account to drop out of mind.

In the archaeology of the countryside we have done and are doing much that is of value. A village site like Thundersbarrow has had plenty to tell us ; the excavation of the Ditchley villa in Oxfordshire has already been followed up at Welwyn and at Angmering, and if the problems of the villa-system, and of its seeming antithesis the aggregation of peasant villages, are not yet solved, we can at least claim that we are actively thinking and working to that end. Agriculture, indeed, looms larger among our preoccupations, and one of the most remarkable of all the triumphs of air-photography has been the revealing of the intensive agricultural settlement of the Fens in Roman times. Last year's disastrous floods have put a temporary stop to the Fenland Research Committee's activities in this field, but it has a great programme before it, and if, as seems highly probable, the Fens were from the start Imperial domain land, there is the chance here of a minute cartographic and historical survey which would be without equal in the whole of the Roman Empire.

But besides army, town, and country I want to set a fourth subject, no less important and considerably more neglected. That is the industrial life of the province. The importance of mining in Roman Britain has emerged from Prof. Collingwood's new book more clearly than ever before. And yet we know very little about the industry itself. The British lead-mines, above all, have been treated by the modern excavating archaeologist with undiluted neglect. Yet at Charterhouse-on-Mendip alone there are probably unique opportunities. It is true that the re-smelting of Roman slag-heaps, sixty-seventy years ago, must have done some damage to the site of the mining settlement. But no one who has ever been there will disagree with Haverfield's 'conviction that the long grassy slopes . . . conceal more than has yet been found, and that further exploration might reveal the vestiges of definite buildings, the records of the local administration, the furnaces and moulds of the smelters, and

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the roads or communications by which the mining settlement on the upland plateau sent its goods to the outer world.' For my part, if I were asked to name the most promising Roman site in Britain for a single big, carefully-planned excavation, I should choose this without hesitation. The Mendip mines must have reflected every phase of the rise and fall of the province's prosperity, and here if anywhere in Roman Britain is the value of archaeology to economic history likely to make good showing under a crucial test.

The pursuit of Roman Britain into the 5th century is one to which all excavators, whether in London or Verulamium, Richborough or Pevensey, or the countryside of the west, have recently found themselves stimulated by the numismatist, the documentary scholar, and the art-historian. In fact, I do not think that our aims and needs in this direction need any formulation from me. But I do think that we ought to be more alive to our responsibilities on the other side of the Dark-Age picture, the archaeology of our Anglo-Saxon forefathers. You will remember that the Peers Report credited us with so full a knowledge of Anglo-Saxon cemeteries 'that further work in this sphere is to be deprecated.' Yet it is notorious that the dating of Teutonic jewellery and metalwork is the subject of acute controversy, as a glance through the recent literature of the Taplow Barrow is enough to show; while from the pioneer, but steady steps which Mr. J. N. L. Myres is taking to make a tractable subject of our Teutonic pottery, we are learning first how shockingly it has been neglected hitherto, and secondly how serious is the dearth of good publications of cemeteries. A grave-by-grave study of a really big early cemetery does not exist, and what is worse, there is very little general interest in repairing the omission. I do not suppose there are more than two or three people in this room who are aware that the excavation of the largest pagan cemetery ever methodically examined in this country is in the coming year approaching completion, and the idea of sponsoring its publication has very possibly not yet crossed the mind of anyone with a direct say in the disposition of our central resources. And since only one pagan village has ever been published or indeed excavated at all, I feel that this is a sphere where we have certainly no grounds for complacency. The only way to make our Pagan-Saxon archaeology look at all satisfactory is to compare it with our record for the Christian-Saxon period. Here the Peers Report specifically called for action—and action indeed there has been, but action not crowned with success. No statement has yet been

issued that the 'burh of the Saxon Reconquest' announced some years ago at Witham turned out to be in origin a camp of the Pre-historic Iron Age, still less is there any sign of the excavator's report. This is an omission which should be repaired without delay, and when that is done perhaps we can once more set about filling a gap of four full centuries which is a standing reproach to the good name of British excavators. The admirable achievements of recent years in dealing with early medieval castles show by contrast something of what could be done, and if we want to improve on these and carry still further the field archaeologist's contribution to medieval English history, we have only to consider the possibilities offered by the English village. The sites of Domesday vills whose population and resources in the outgoing 11th century are minutely recorded in our great national Survey must exist in many places free from modern encumbrances; what a fine counterpoise it would be to all our doings in prehistory if we could enhance the light of history with the excavation of a few of these! Or, if the need for a firm limiting date be considered paramount, the start could be made from that great cleavage-line in our social history the Black Death. Villages abandoned then and never re-occupied are known in almost every county, and documentary evidence concerning them too; an archaeologist's picture of a 14th-century English peasant community would be a unique contribution to historians' knowledge of the Middle Ages, on the eve of the Revolt of 1381 and its far-reaching sequels in the structure of our rural life.

I have said enough to show that there is no lack of good work for us to do, both in the field and the study. I only wish to add one further word of counsel. I think we should not simply be revising our strategy for the field, but making sure that we shall keep up with the demands of the study for proper vehicles of publication. For, as I said at the beginning, the activities of our archaeology are apt to be conditioned by its mechanism, and that mechanism tends at present to divide our publishable results broadly and simply into small papers and large, with a limit on the size of the latter which can only be exceeded in the case of Reports of the Society of Antiquaries' Research Committee. Much of what I, no less than anyone else, would like to see published can easily be covered by this very reasonable dispensation. But some of our chief needs can only be met satisfactorily in book form. The Corpus of Stratified Flints which I suggested just now is a case in point. Again, it is known that one of our most energetic colleagues has in hand a Corpus

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of Beaker Pottery. To take a third and still more urgent case, how long will it be before the large-scale publication of Romano-British pottery catches up with its excavation? The Verulamium excavations, for example, must have produced a sequence of reliably-dated pottery, from the Claudian period onwards, without parallel in the history of the subject. There was obviously far too little room for it in the main Report: but is that pottery never going to be published? Undertakings of this kind demand special treatment, and I have by no means exhausted the possibilities. I should like then to end by expressing the hope that this Institute, before too long, may be able to add to its enterprises the issue by subscription of a series of outstanding archaeological monographs, of this kind for which there is no provision elsewhere. Once inaugurated, its continuance would long be an indispensable need, and the honour of contributing to it would be for many archaeologists a cherished aim.

Subscribing Membership of the Institute

A SUBSCRIBING membership of the Institute of Archaeology has been established for the benefit of those who are interested in its aims and policy and are ready to assist in its development as subscribing members, in return for certain rights and privileges. In this manner, those who are unable to contribute largely to the endowment of the Institute will help materially in the furtherance of its work and will at the same time, it is hoped, be enabled to maintain closer contact with its activities.

The following is the substance of the appeal recently issued.

The increasing range and developing technique of archaeology have in recent years intensified the need for an institution where archaeological students may have ready access to classified materials and find help and instruction in their use. Such an institution would properly form a focus for reports of recent work and for exhibitions illustrating it. It would, furthermore, serve in some degree as a temporary store and 'clearing-house' for archaeological expeditions engaged upon the task of working through new material for publication and distribution.

For such an institution, London is not the only possible location, but the metropolis has, and always must have, certain special claims to suitability. Realising this, the University of London, as the appropriate academic body, has recently established an Institute of Archaeology and has housed it in the capacious building formerly known as St. John's Lodge, near Bedford College, in Regent's Park. The Institute is administered by the University through a Management Committee, the names of which will be found on the back of the title-page of this Report.

The development of the new Institute will be regulated, as funds become available, in accordance with a policy based upon the relative urgency of current needs in archaeological studies. The Near East—Mesopotamia, Syria, Palestine, Anatolia and Cyprus—where research has in recent years been particularly active, are at present inadequately served by our universities, and no fitting provision is available for the comprehensive training of the students

SUBSCRIBING MEMBERSHIP OF THE INSTITUTE

who are entering those fields. Even at home in Great Britain, where archaeological exploration has expanded to an unprecedented extent during the last decade, the facilities for instruction and research are disproportionately small. Moreover, little attempt has yet been made to provide systematic training in archaeological technique, which varies in detailed application rather than in principle in the several fields of archaeology, and is capable, therefore, in considerable measure of centralized initial training.

These and other needs come within the province of the new Institute. In the absence of extensive endowment, however, it can only hope to meet them gradually in proportion to the support which it receives from the interested public. At the outset, as the present Report indicates, it can already show progress in certain directions. These preliminary activities are useful, but they mark no more than a beginning. The large Palestinian collection, for example, urgently needs a whole-time curator who can combine with his curatorial work the general development of Palestinian and Biblical studies in the University. Dr. Zeuner's work in geochronology needs permanent endowment, while the income from the capital endowment of the Institute in respect of administrative staff falls short of minimum requirements.

The membership will consist of those who are prepared to subscribe one guinea or more per annum to the development of its work and objects. Membership will entitle subscribers to the following :—

- (1) Notices of all lectures, exhibitions, etc., at the Institute.
- (2) The annual report and 'occasional papers.'
- (3) Use of the Institute's library and photographic collections.

The services which the Institute can render to its members will necessarily bear a ratio to the extent of the membership ; but in establishing this membership the University emphasises that its main objective is to provide a medium whereby those who are not in a position to make large donations may be able to contribute in proportion to their means, and so help to extend the usefulness of the Institute as a metropolitan centre for archaeological students—in the fullest sense of the term—from all universities and all parts of the world.

Tessa Verney Wheeler Memorial Bursary

IN accordance with the wishes of the majority of subscribers, it was decided that the fund collected in memory of Tessa Verney Wheeler should be devoted, after the provision of the tablet (the unveiling of which is described elsewhere), to the establishment of a bursary for the assistance of archaeological students. The capital, amounting to £569, has been invested in the name of the Society of Antiquaries of London, and the interest will be devoted to this object. The administration is in the hands of a committee partly appointed by the Society of Antiquaries and partly by the Institute of Archaeology. The object of the bursary is to give assistance to students in archaeological studies in any way which may appear most useful to the committee. It may, for instance, be given for travel for the purpose of research, for the purchase of books and equipment, or for assistance in living expenses during excavations or while pursuing a course of study. The bursary may be divided among a number of students, or given to one only, or it may not be awarded at all in a particular year if there is no suitable candidate.

It is realised that the amount available is not large, but it is felt that even small grants will often make a great deal of difference to some students. Everyone would agree that the use of the fund in this way would have been in accordance with Mrs. Wheeler's wishes, and it is hoped that, once a fund such as this has been started, it may form a nucleus to which additions may from time to time be made.

The first appointment to the bursary will be made in the autumn of 1938, and teachers or field-workers who hear of suitable candidates, should apply to the Secretary, Society of Antiquaries, Burlington House, W.1.